MAY, 1942

Rock Products

THE INDUSTRY'S RECOGNIZED AUTHORITY

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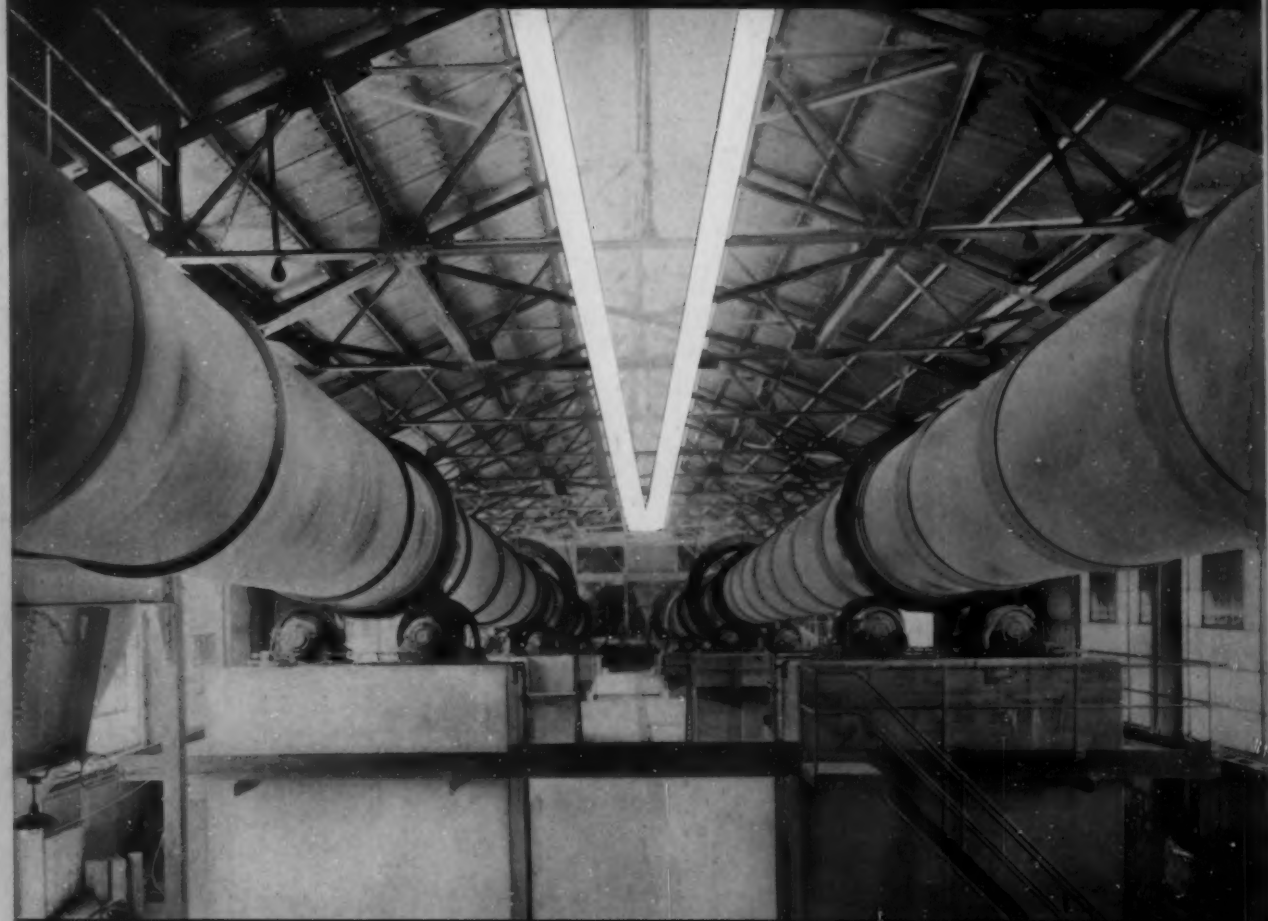
GENERAL SERIAL RECORD

Food — Agricultural lime and limestone play important role . . . Grinding practice uptodate . . . Merchandising that will promote new markets . . . Concrete products in a clay market

UNAX ROTARY KILNS
FOR CEMENT—LIME—ORE

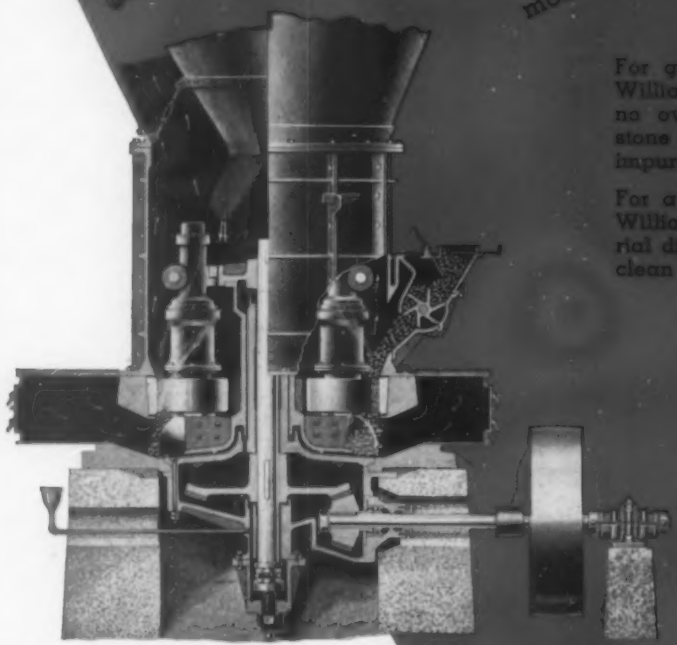


F. L. SMIDTH & CO.
60 EAST 42ND STREET
CEMENT ENGINEERING
CEMENT MACHINERY
NEW YORK, N. Y.

Williams

Fine Grinding Equipment for all Branches of the LIME INDUSTRY

Contemplating Improvements? — then investigate the Williams complete line of Lime Plant crushing, pulverizing and air separating equipment — successfully operating in a large number of today's modern lime plants.



HYDRATED LIME

For grinding hydrated lime to 400 mesh — the Williams Impact Mill. Permits perfect sizing with no oversize — eliminates cores and unburned stone with minimum of hydrate rejected with the impurities.

For a super-high grade chemical hydrate — the Williams Mechanical Air Separator. Takes material directly from the hydrator and separates the clean hydrate from the impurities.

BURNED LIME

For finenesses ranging from 98% — 200 mesh to 99%—325 mesh—the Williams Roller Mill with Spinner Air Separator. No clogging of separator — impurities spouted out or reground to same fineness as the lime.

AGRICULTURAL LIMESTONE

The Williams "Slugger" Crusher will handle quarry run rock and reduce to agricultural limestone in one operation —seven sizes—30 to 150 horsepower.

Sectional view above of the Williams Improved Roller Mill, photo below shows operator producing agricultural limestone with Williams Mill.

Williams Patent Crusher & Pulverizer Company

800 St. Louis Ave. St. Louis, Mo.

OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD

REG. U.S. PAT. OFF.

PATENT CRUSHERS GRINDERS SHREDDERS

IN QUARRY HAULAGE:

What you don't know ~~won't~~ will hurt you

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CENTRAL SERIAL REC

Above: EASTON TR-15H Trackless Mine Car. Average payload 22-25 tons. Hydraulic body hoist optional. Two other sizes. Write for Bulletin 175.

You're risking big money when you don't know where the pennies go...

A few pennies saved or lost on every ton of ore or rock you haul can make a five or six figure difference in your yearly operating costs. Just in dumping alone, seconds can rob pennies from every payload.

Perhaps you're too busy – particularly today – to go over the details of cost-per-ton. But, sooner or later, the time will come when what you don't know *will* hurt you.

Why not get a down-to-the-penny check-up on your haulage costs, by Easton industrial transportation engineers? An Easton Survey will cost you nothing and will incur no obligation. These experienced men can give you an unbiased report on either track or trackless haulage.

How Easton Can Help You

An Easton Survey will provide you with an accurately scaled map of your mine, pit or quarry, including haulage routes, location of shovels, crusher, etc. With this map will be a tabular analysis of routes, equipment and capacity; a detailed time-and-cost study covering every step from loading to dumping; and a summary of investments and depreciating periods based upon the most practical type of haulage for your service.

These facts will help you to plan ahead for new equipment. At the same time, the survey may point the way to immediate speed-ups and short-cuts with your present equipment. For complete information write to Easton Engineering Counsel.

The famous EASTON Phoenix Quarry Car. Doorless. 2-way dump. Timken bearings.

Above: EASTON Won Way Car. Below: EASTON Cornwall Car. Both have automatic down-folding door, Timken bearings.

EASTON

EASTON CAR & CONSTRUCTION COMPANY, EASTON, PA.

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Rock Products

Recognized the World Over as the Leader in Its Field

With which have been consolidated the journals *Cement and Engineering News* (founded 1896) and *Concrete Products* (established 1918)

VOL. 45, No. 5, MAY, 1942

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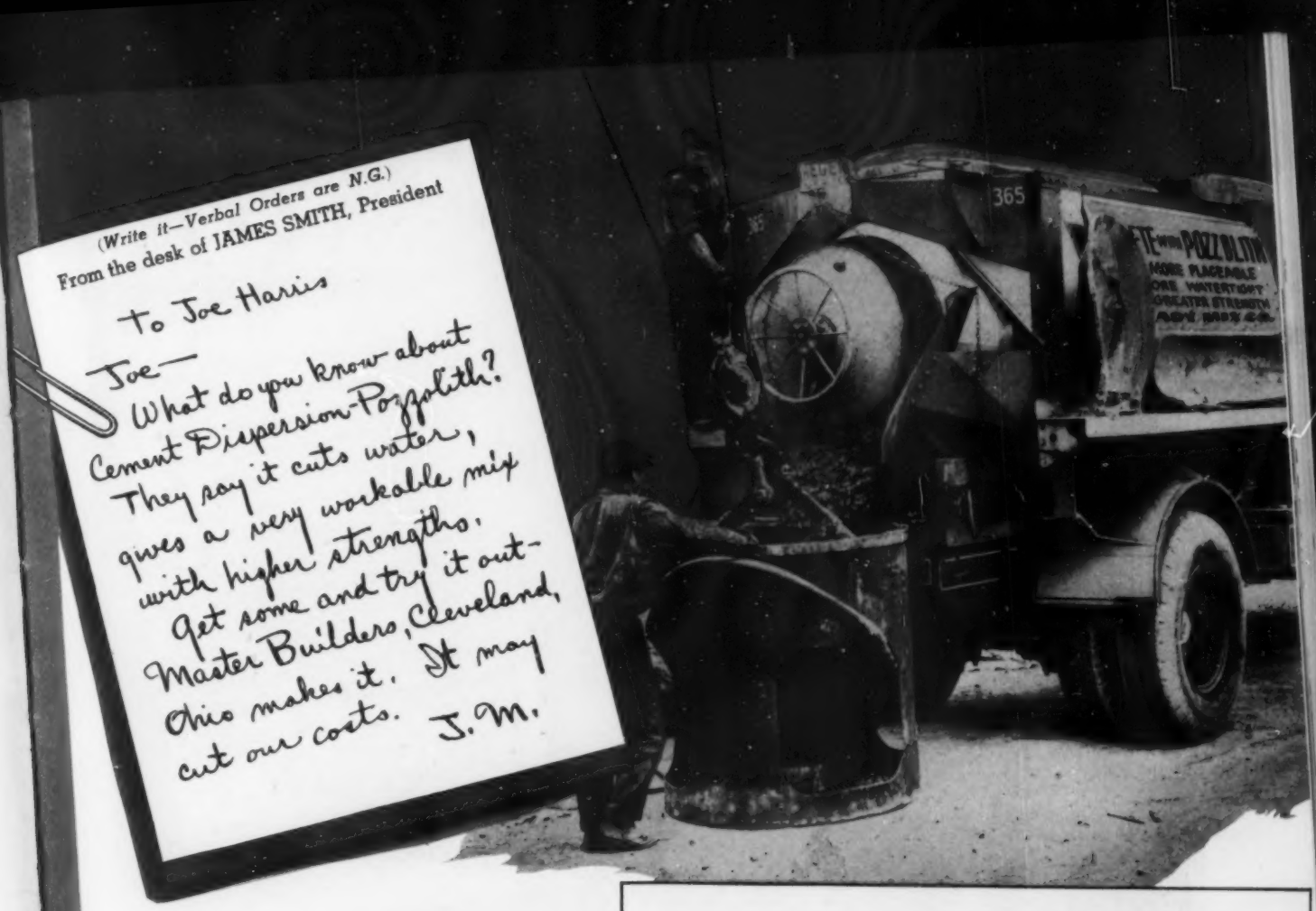
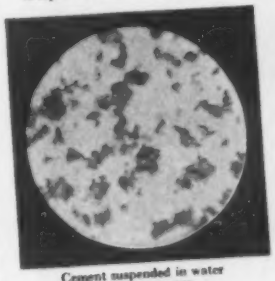

(Write it—Verbal Orders are N.G.)
From the desk of JAMES SMITH, President
To Joe Harris
Joe—
What do you know about Cement Dispersion-Pozzolith? They say it cuts water, gives a very workable mix with higher strengths. Get some and try it out—Master Builders, Cleveland, Ohio makes it. It may cut our costs.
J. M.
365
POZZOLITH

HOW CEMENT DISPERSION WORKS

Only a part of the cementitious value of the cement, whether normal portland or high early, is utilized under usual construction conditions. Investigation shows that with 28 days curing only 50% hydrates. [Anderegg and Hubbell, A. S. T. M. 29 II 554 (1929)].

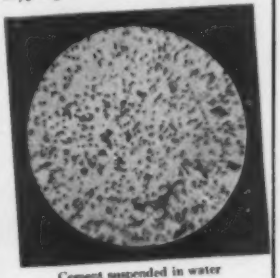
Dispersed cement produces 25% to 40% higher compressive strengths.



Cement suspended in water
UNDISPERSED

WITHOUT POZZOLITH

In a normal concrete mix, cement particles tend to bunch together, thereby (1) limiting hydration and (2) trapping water within the cement clumps. (See photo-micrograph above).



Cement suspended in water
DISPERSED

WITH POZZOLITH

Cement Dispersion drives these particles apart and (1) exposes their entire surface area to hydration, at the same time (2) making the water entrapped in the clumps available for lubrication of the mix. (See photo-micrograph above)

THE YOUNGSTOWN ICE COMPANY

DEALERS
CONTRACTORS' AND BUILDERS' SUPPLIES
COAL AND COKE - SEWER PIPE
MIXED CONCRETE-WET OR DRY
YOUNGSTOWN
OHIO

The Master Builders Co.,
7016 Euclid Avenue,
Cleveland, Ohio.

Subject: Pozzolith

Gentlemen:

...we have been able to deliver a mix of greatly increased density and water-tightness by the addition of Pozzolith, which maintains an ideal mobility, yet permits the elimination of from 15 to 20% of the total water. This low water ratio likewise results in substantial increases in strength.

We have found it easy to use Pozzolith at our plant, and the ability to deliver low water ratio concrete which places easily, finishes well, and does not segregate en route, is of definite advantage. We have been complimented on the absence of water gain on the concrete we have furnished with Pozzolith.

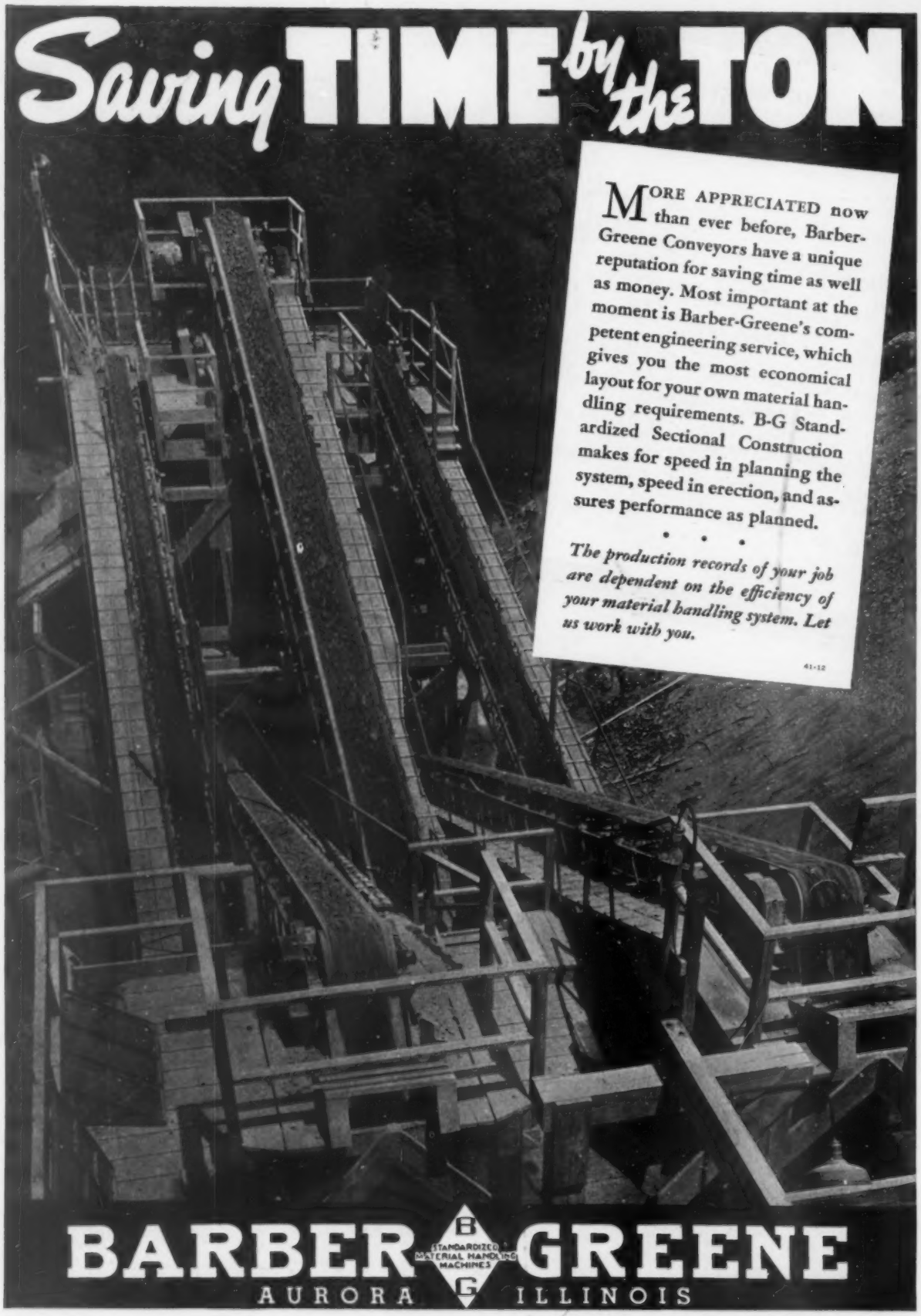
Yours very truly
The Youngstown Ice Company
By

EJH: AW

CLEVELAND, OHIO **THE MASTER BUILDERS COMPANY** TORONTO, ONTARIO

CEMENT DISPERSION = GREATER READY-MIX PROFITS

Saving TIME by the TON



MORE APPRECIATED now than ever before, Barber-Greene Conveyors have a unique reputation for saving time as well as money. Most important at the moment is Barber-Greene's competent engineering service, which gives you the most economical layout for your own material handling requirements. B-G Standardized Sectional Construction makes for speed in planning the system, speed in erection, and assures performance as planned.

• • •

The production records of your job are dependent on the efficiency of your material handling system. Let us work with you.

41-12

BARBER GREENE

STANDARDIZED MATERIAL HANDLING MACHINES

AURORA ILLINOIS

Built by
UNIVERSAL VIBRATING SCREEN CO.

SKF

BALL AND ROLLER BEARINGS

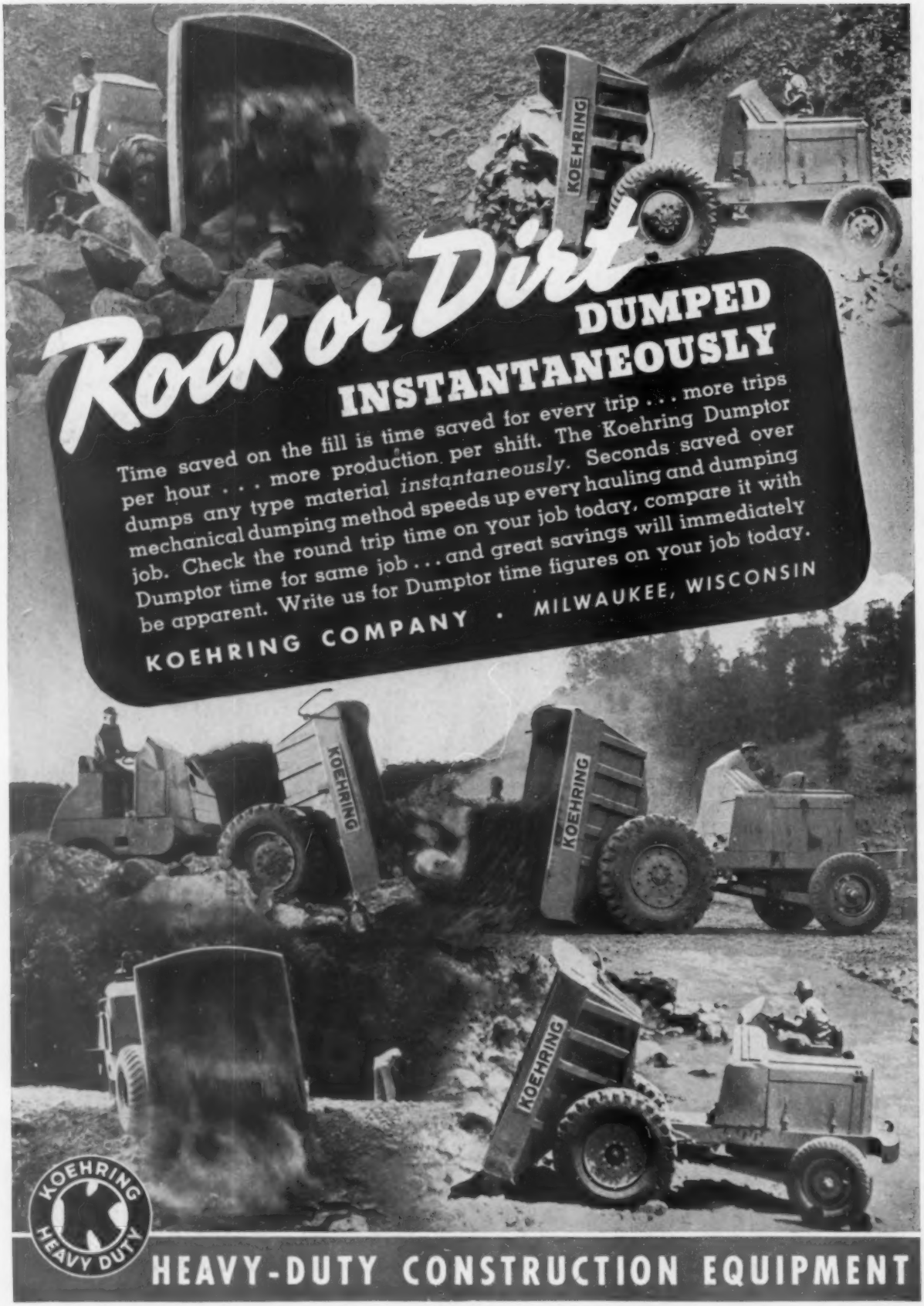
Production Problem?

REFER *it to* SKF

If you're a manufacturer of quarry machinery in search of a shortcut to Peak Production, you can take a tip from Universal engineers. They designed this screen for a vibratory action of 1800 vibrations a minute. And in this design they included SKF Bearings to take the abuse of pounding loads . . . to stand up on a machine that does a full day's work *every* day in a neighborhood of dust and dirt. SKF's have a large safety factor and inherent alignment that makes full load carrying capacity a certainty despite shaft deflections, distortions or weave. They're the answer to production problems on machines of all kinds. 5036

SKF INDUSTRIES, INC., FRONT ST. & ERIE AVE., PHILA., PA.

BUY defense BONDS


Rock or Dirt
DUMPED
INSTANTANEOUSLY
Time saved on the fill is time saved for every trip . . . more trips per hour . . . more production per shift. The Koehring Dumptor dumps any type material *instantaneously*. Seconds saved over mechanical dumping method speeds up every hauling and dumping job. Check the round trip time on your job today, compare it with Dumptor time for same job . . . and great savings will immediately be apparent. Write us for Dumptor time figures on your job today.
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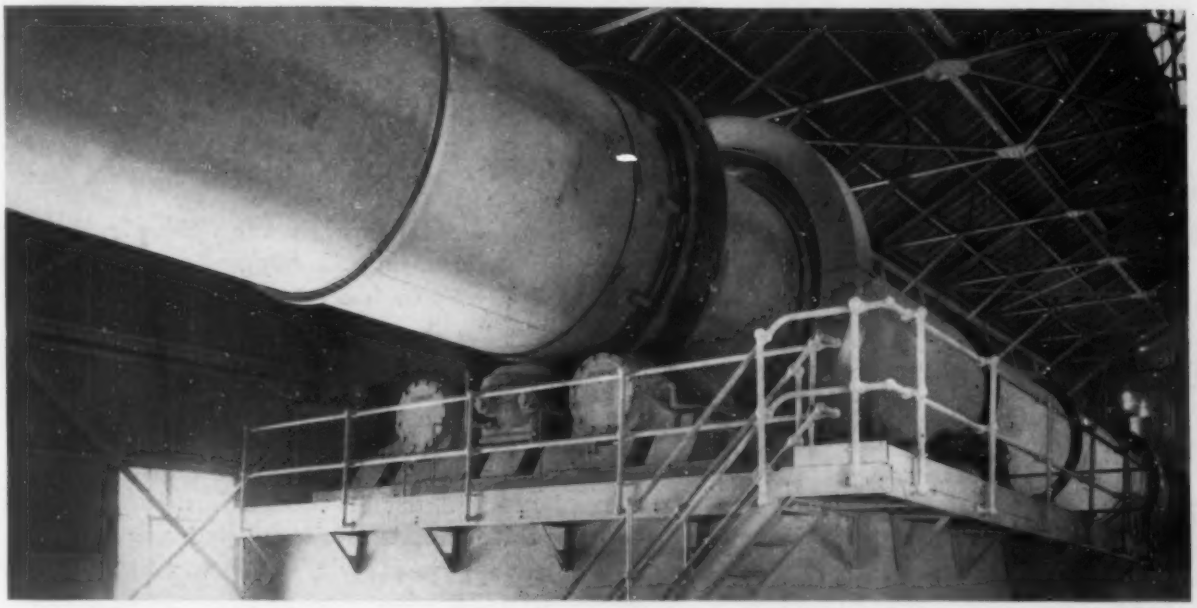
HEAVY-DUTY CONSTRUCTION EQUIPMENT

TRAYLOR

KILNS ★ COOLERS ★ DRYERS



WE BUILD

Rotary Kilns
Rotary Coolers
Rotary Dryers
Rotary Slakers
Scrubbers
Evaporators
Jaw Crushers
Gyratory Crushers
Reduction Crushers
Crushing Rolls
Grinding Mills
Ball Mills
Rod Mills
Tube Mills
Pug Mills
Wash Mills
Feeders
Rotary Screens
Elevators

NOW, when perhaps more so than at any time in America's history, PRODUCTION is the nation's watchword, it is imperative that industrial and manufacturing machinery be completely trustworthy. That is the one outstanding reason why purchasers of rotary kilns, coolers and dryers should make certain that the name plate says "TRAYLOR." For Traylor equipment is not mere masses of metal fabricated into certain forms. Built into the machines are the ideas of our engineers, who have a broad and intimate knowledge of the work to be done by users, and the problems that arise constantly during operation. As a result, Traylor Rotary Kilns, Coolers and Dryers do their jobs at top speed and capacity, without more than a minimum of attention and at bottom unit cost.

America's, and a considerable part of the world's, leading cement, lime and chemical manufacturers, not to mention those in other process industries, have known and used — and made big profits — for many years, with Traylor Rotary Kilns, Coolers and Dryers. And hosts of the not-so-big, too! So, if YOU desire to have YOUR burning, cooling and drying jobs done masterfully and economically, make your specifications for equipment read "built by Traylor."

One more point. We maintain extensive facilities for rendering expert advice and assistance to plant engineers and operators. Use them freely, without obligation.

WRITE FOR BULLETIN NO. 115

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ENGINEERING & MANUFACTURING CO.

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MANILA MACH. & SUPPLY CO., INC., Manila and Baguio, P. I.

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Allis-Chalmers

THE NEW 4-WAY

FOR HIGHER SCREENING CAPACITY . . . LONGER CLOTH LIFE!

Longitudinal Tensioning Gives Flat Transverse Section . . . Uniform Bed Thickness! Deck Sections Are Interchangeable and Reversible — a New Feature That Cuts Replacements to a New Low!

If you're wasting high-grade steel with too frequent cloth replacements . . . if you're looking for increased capacity from the screens you buy . . . here's a new development that's making screening history — the new Allis-Chalmers 4-WAY Deck!

Because the cloth is tensioned lengthwise along the screen, you get an absolutely flat transverse section. The bed is distributed uniformly across the entire width. And the cascading action imparted to the material as it tumbles from one section to the next turns the bed upside down . . . decreases matting tendency of damp material.

That means you get increased screening efficiency . . . higher capacities for a given feed! And you can maintain uniformly good separation with higher rates of feed than were ever possible before!

For dewatering service, the new 4-WAY Deck is especially effective. Transverse buffer strips that support the cloth act as drip strips . . . prevent water from running down the screen.

Cloth Life Increased!

Best of all, this new deck is interchangeable and reversible *(see sketch)*. Screen cloth may be used safely until approximately 2/3 of its wire diameter is worn away. Then instead of throwing the deck away, you merely reverse the 4-WAY Deck and get an almost equal amount of wear in this position!

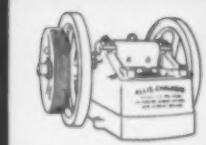
What's more, to offset the greater wear to which the feed end is subjected, the sections of the deck can be interchanged in a few minutes — a feature that will appreciably lengthen your cloth life.

Call on Cooperative Engineering!

The new 4-WAY Deck represents another in the long list of advancements Allis-Chalmers Cooperative Engineering has contributed to the industry. Our unrivalled experience and facilities are at your complete disposal whenever you are faced with a production problem.

Why not take advantage of this service soon? It's available to you with no cost or obligation! Allis-Chalmers, Milwaukee, Wisconsin. A 1518A

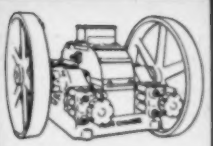
Get "All Out" production with ALLIS-CHALMERS



Jaw Crushers—Primary and Fine Reduction

Large Gyratory Crushers Up to 60 in.

Type "R" Crusher with "Speed-Set" Control

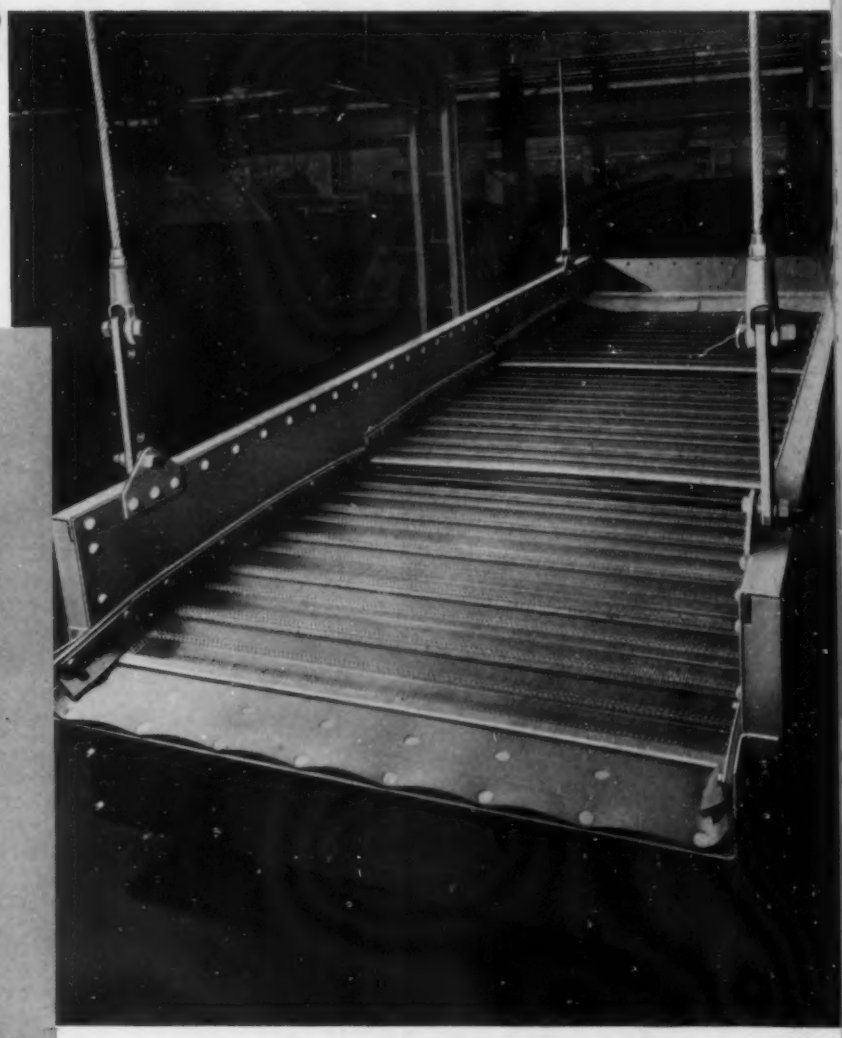


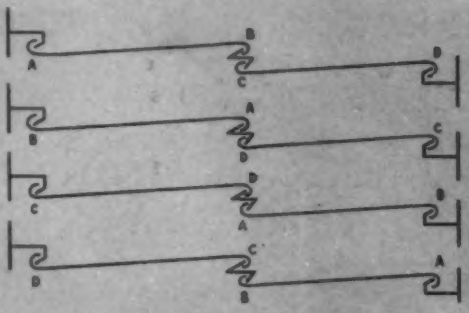
Crushing Rolls for Granular Products

Pulverators (Multi-impact Hammer Mills)

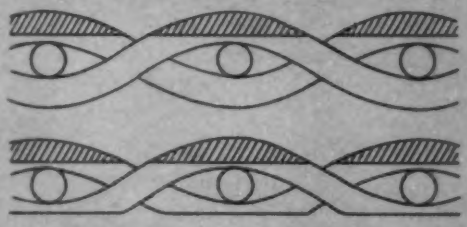
Announces...

DECK





NEW 4-WAY DECK IS INTERCHANGEABLE and reversible. Note the four positions in which it can be used on a two-section unit. Where more than two sections are required, the intermediate sections are tensioned by an adjustable clamping bar controlled from the sides of the screen.



AFTER THE WIRE HAS BEEN WORN DOWN on one side, the 4-WAY Deck can be reversed . . . and almost double the wear obtained. By interchanging feed and discharge end sections, you can even get additional cloth life.

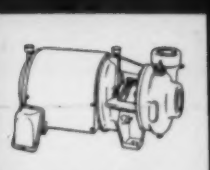
EQUIPPED WITH A THREE-SECTION 4-WAY DECK, THIS 5 FT BY 14 ft Allis-Chalmers Ripl-Flo has even greater performance possibilities. Each of the complete line of Allis-Chalmers vibrating screens can now be supplied with this new deck.

COOPERATIVE ENGINEERING

Low-cost, High-capacity Ripl-Flo Screen

Kilns, Coolers, Dryers for Cement and Lime

Cylindrical Grinding Mills — 30 Different Types



Electrifugal Pump — Compact, Low-cost

Lo-Maintenance Motors, Texrope V-Belt Drives

. . . With Your Ideas on Ways to
SPEED PRODUCTION *with* COMPRESSED AIR

Here's how you can contribute IDEAS to help win the war.

DO THIS: Describe some application of compressed air which speeds production (in your own experience or observation). The IDEA counts—not the grammar. Simple rules mailed on request.

YOUR OPPORTUNITY to pass along ideas which will speed up production and help win the war. Substantial cash prizes offered. Prize-winning papers will be brought to attention of your industry, giving recognition and prestige to the authors. All entries of value to the war effort, whether they are prize-winners or not, will be offered to the proper United States Agency with full credit to the writer.

PRIZES DOUBLED. Because of increased importance of compressed air in the war effort, prize awards as originally announced, have been doubled, and closing date has been extended to July 1, 1942.

ATTENTION EXECUTIVES. Posters announcing this IDEA Award Program are available to enable you to bring this project to the attention of your engineers and shop men. Free on request.

All requests for Rules and Posters should be addressed to Russell Gross, Educational Director, Compressed Air Institute, East Orange, New Jersey.

★ ★ ★ ★ ★ ★ ★ ★

$1000.00 IN CASH AWARDS

FIRST PRIZE $200.00 — THREE PRIZES OF $100.00

TEN PRIZES OF $50.00 — SPECIAL AWARDS $25.00 EACH

For every non-prize winning entry which is accepted for publication in a technical journal, at the request of the Compressed Air Institute.

plus

PERSONAL PRESTIGE and RECOGNITION

Uncle Sam Needs Your Ideas

HERE'S HOW YOU CAN HELP

Describe compressed air applications in your own experience or observation, which speed up production. The IDEA will be passed along to help the war effort. Write today for details.

This announcement appears here through the courtesy of

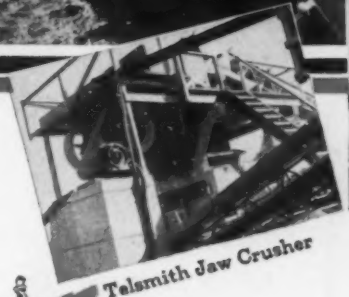
FULLER COMPANY • **Catasauqua, Pennsylvania** • ***Member of:***

COMPRESSED AIR INSTITUTE..
90 WEST STREET — NEW YORK, N.Y.

TELSMITH Gravel Plant

goes all out

FOR WIN-THE-WAR CONSTRUCTION



Telsmith Jaw Crusher

Telsmith Sand Tanks

Telsmith Gyrasphere

★ Minus and plus ¾″ and minus 1½″ gravel, and sand is in demand for war projects in the vicinity of Pawtucket, R. I. Starting operation Nov. 1, 1941, this new Telsmith equipped gravel plant of J. J. McHale & Sons near Pawtucket is turning it out at about 125 to 150 tons per hr.

A 1¼ cu. yd. shovel and two end dump trucks feed raw bank run gravel into an 8 cu. yd. hopper having a railroad rail grizzly that rejects the few oversize boulders. A 30″ x 5′6″ Telsmith Reciprocating Plate Feeder feeds material out of hopper and over a No. 450 Telsmith Rotary Grizzly with 3¼″ spaces. Plus 3¼″ goes to an 18 x 30 Telsmith Roller Bearing Jaw Crusher. A 30″ x 73′ belt conveyor takes minus 3¼″ direct from the grizzly, and from the jaw crusher, to a 4′ x 10′ Telsmith Single Deck Pulsator. Plus 1½″ from this scalping screen goes into a No. 36 Telsmith Gyrasphere Crusher; and when crushed returns to the 30″ primary conveyor via an 18″x48′6″ conveyor.

Minus 1½″ from the scalping screen goes via a 24″ x 186′6″ finished product conveyor to a 5′ x 12′ Telsmith 2-Deck Pulsator for washing and sizing. Sand is flumed to two No. 8 Telsmith Sand Tanks on a tower independent of main plant. The two sizes of gravel are deposited in two 20′ diam. concrete-block silo bins, fitted with bin gates for loading into trucks.

Why do so many operators with war construction jobs depend on Telsmith? Because Telsmith equipment can be pushed to *top speed* and *will produce*. Telsmith Engineers' plant planning is sound. Telsmith Service is fast. *Get Bulletin G-11.* G-10

SMITH ENGINEERING WORKS, 508 E. CAPITOL DRIVE, MILWAUKEE, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

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MINING
Speed up the War Effort
with INCREASED PRODUCTION
Here are a few recent shipments of Symons Cone Crushers and Screens which will increase the output of important materials. In addition to the production of metals and industrial minerals, this equipment is producing the materials required for the construction of air bases, flying fields, cantonments, supply depots, docks and other facilities needed by our armed forces.
STONE
GRAVEL
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INDUSTRIAL MINERALS
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NORDBERG MFG. CO. MILWAUKEE WISCONSIN
NEW YORK · LOS ANGELES · LONDON · TORONTO
SYMONS CONE CRUSHERS

Rock Products

309 WEST JACKSON BOULEVARD
CHICAGO, ILL.

May 1, 1942

Dear Subscriber:

Washington, D.C.: Various schemes are being proposed to force the greater sale of government war bonds. Senator George, chairman of the Senate Finance Committee, would induce savings by permitting a taxpayer to deduct from net taxable income that portion of his income invested in war bonds. He also suggested a "withholding" or gross receipts tax of five percent collected at the source on all wages, salaries, dividends and interest. He said such a gross receipts tax would yield four billion dollars. He expressed the opinion that taxation could take care of excessive war profits but did not oppose an over-all limit on profits which could be earned from war contracts. We suggest all employers do everything possible to promote the sale of war bonds, not only to provide war funds but to promote saving and prevent inflation.

Springfield, Ill.: Four employes of the Ozark Mineral Co., Elco, Ill., silica producer, were arrested April 10 as saboteurs - "on charges of interfering with and obstructing the United States war effort." The F.B.I. made the arrests. The management said bits of iron, wire, wood, whiskey bottles, etc. were thrown into the product. Apparently, it was pure cussedness rather than sabotage, but the entrance of the F.B.I. is interesting.

Washington, D.C.: National Resources Planning Board has charted consumer expenditures of a 59 billion dollar national income in the fiscal year 1935-36. Food was by far the largest item - about 17 billion; housing about 10 billion, household operation a little over 5 billion and clothing about the same (5 billion). Now it is announced that the average factory worker's weekly income advanced 26.6 percent between June 1940 and the U. S. entry into the war. The cost of living increased only 8.1 percent. Obviously about half the cost of living is the cost of food and shelter - with food alone accounting for about one-third. How can we please the farmer by raising food prices and the worker by holding down wages and get 'em both to keep us in office? Write your congressman the solution. He's puzzled.

New York City: According to "Engineering News-Record" heavy construction volume in March rose to $729,485,000, the second highest monthly total ever reported, and 61 percent over the March, 1941 figure. Public construction was responsible for the gains, topping last month's mark by 17 percent, and rising 76 percent above a year ago. Private construction, however, was 3 percent under a month ago, and 13 percent below last year. Both state and municipal, and federal work gained over February, 1942, but state and municipal fell 52 percent from the 1941 month, while federal gained 120 percent. The March construction total brought the volume for the first quarter of 1942 to $1,993,088,000, a new record, and 36 percent higher than the previous peak established in the opening quarter last year. Private construction,

at $187,704,000, was 52 percent lower than a year ago, but public work at $1,805,-384,000, rose to a new high, 68½ percent above 1941. Volume for the week ended April 9 was $246,344,000, the third highest of the year. It tops the previous week by 130 percent, and is 77 percent over the corresponding 1941 week.

Chicago, Ill.: Nothing shows better than the foregoing the trend of the times. We don't need to be reminded that all private construction, using critical materials, is chopped off by executive edict. There is plenty of demand for rock products construction materials, concentrated in 5-million to 100-million jobs, but "it ain't where it used to be." Consequently live-wire producers are joining forces and going far afield from their home bailiwicks to get the new business. It's either that or close up shop for producers not in the "war zones."

Plainfield, N. J.: The National War Labor Board established a new precedent here in a C.I.O. dispute. It ordered a contract drawn which would compel all employes who were members of the union at a certain date, or have since joined, to remain members and pay their dues until the expiration of the contract, unless they could prove they became members under duress, or coercion. Those who had belonged and dropped out would be compelled to rejoin, but not compelled to pay back dues or fines. New employes could join or not, but if they did they would have to stay in until the expiration of the contract. Seems fair to compel a worker to live up to his contract once made voluntarily. Other men are supposed to.

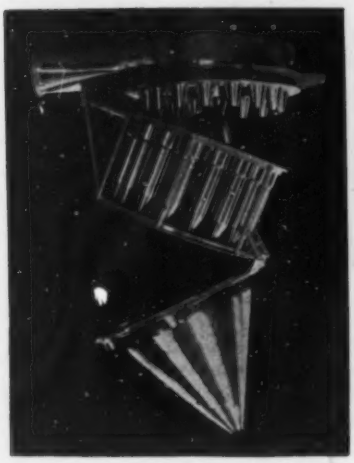
Chicago, Ill.: We have seen worked-out limestone mines and quarries used for many purposes, from mushroom growing to public parks, but now, according to "Iron Age," British aircraft is being built in underground factories, established in abandoned quarries. Modern illumination and air conditioning furnish comfortable working conditions for "around the clock" production. Deep below the surface, these plants are immune to bombing attacks and nature provides the best possible camouflage for them.

Allentown, Penn.: Some of the big cement companies in the South whose production is identified with war contracts have a lot of "sheriffs" in the plant. If you don't have a badge while you are inspecting the plant, they'll jump you. This is just another reminder that the country is at war which confronts the editors in their travels. In the East cement plants have taken part in practice blackouts.

Chicago, Ill.: Several producers of crushed limestone are making a 100 percent minus 20-mesh product for neutralizing acid by-products of powder plants before the waste is flumed into streams. One of the plants, for example, is using a Hercules mill with a table feeder in closed circuit with Tyler Hum-mer screens to make this product which is effective in neutralizing acid waters that would pollute streams, destroying fish and vegetation. Coal mines also have used finely ground limestone to neutralize acid mine waters.

The Staff

Recover strategic materials to meet production requirements



MULTICLONES made of non-corrosive materials meet every requirement for cleaning, inspection or sterilization in process industries.

Production and *more production* is the problem faced by industry everywhere. Meeting the ever-increasing demands of war has put a strain on raw material supplies.

MULTICLONE collection of values conserves raw materials and makes for still greater production. In the chemical, metallurgical, and food industries, just to mention a few, MULTICLONES are proving their recovery value day after day. In one molybdenum plant alone the value recovered each day pays for the cost of the MULTICLONE. Here are some of the things that make MULTICLONES outstanding.

They are compact and may be located in otherwise useless space.

They have a common inlet and outlet which simplifies the flue system and makes a neater and more economical installation.

A common dust discharge simplifies the handling of collected material.

Of all-metal construction, they are fireproof and can be used for the collection of fine particles from either hot or cold gases.

LOW DRAFT LOSS SAVES POWER • COMPACT AND FIRE-PROOF • EASY TO ERECT, EASY TO INSPECT • COLLECT FINE PARTICLES FROM HOT OR COLD GASES

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Please send Bulletin on Multiclone Collectors

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HERE'S THE ENTIRE INJECTION SYSTEM OF THE HD-7 ENGINE

. . . the unit injectors that measure, inject and atomize the fuel, *directly* into the cylinders. That's why combustion is more complete, smoother . . . why starting is easier . . . why servicing and maintenance costs are cut . . . why 2-Cycle Diesels have earned the "rep" as the most simple, dependable engines on the job.

The unit injection system eliminates costly delays . . . factory servicing . . . delicate adjustments! No grief with leaky, clogged, or air-locked high pressure fuel lines . . . because there *are no high pressure lines*. No trouble with costly, troublesome fuel pumps . . . because there *are no fuel pumps*.

Simplicity of design is carried throughout the entire engine so that Diesel experts are unnecessary . . . so that repairs or adjustments are seldom required . . . so that your job keeps running in high gear at all times. Any way you look at it you're ahead with 2-Cycle Diesel power—it offers you more value, more performance, more work for your dollar! Get the inside story of these remarkable engines in our booklet "Modern Tractor Power."

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2-Cycle
THE MODERN DIESEL POWER

HELP BRING VICTORY

1. Extend the life of your present equipment . . . make needed repairs, replace worn parts. Your Allis-Chalmers dealer is prepared to give you A-1 service!
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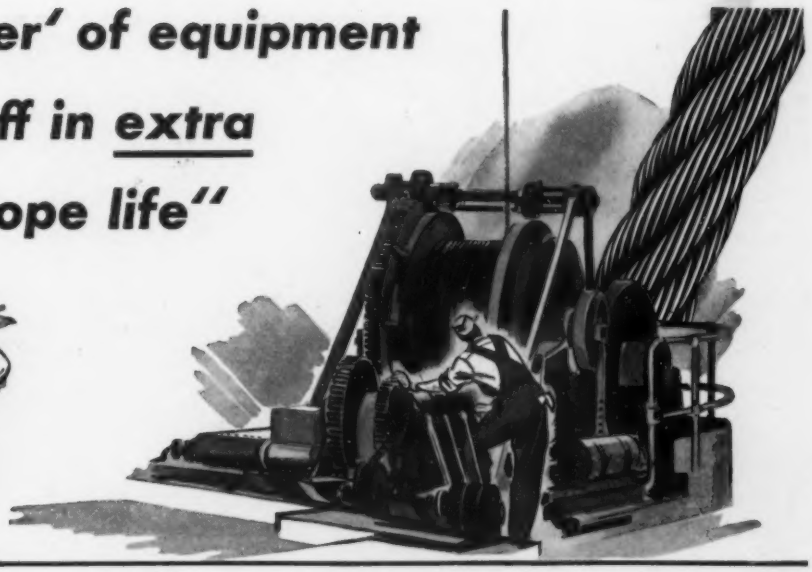
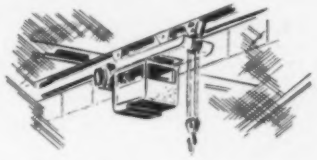
3 SIZES: HD-7, HD-10, HD-14
60 TO 132 DRAWBAR H.P.

"This 'once-over' of equipment pays off in extra wire rope life"



"If you're out to get a full measure of service from your wire ropes, it's just good, common sense to check the equipment it runs on. Not just when you get around to it, but regularly—carefully and often. Make a close check-up when a new rope is installed ...and then check again, frequently—*before* the rope starts to show signs of wear. Take a crane, for example, with a worn sheave.



It will go right along handling every bit of work it always did. But that sheave will cut and squeeze the wires ...and the rope will be through, long before its time.

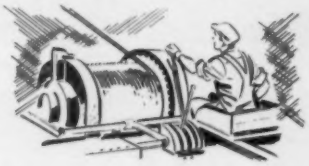
Here are some of the things to look for—some of the reasons why you often hear an operator blame the rope when it was really his own equipment that shortened its life.

First, see if any sheaves are out of alignment. Then check for deeply worn grooves with a gauge,—like this...

The grooves may be scored by an old rope or one of them may have a broken rim that calls for replacement. Sheaves may turn hard or wabble because of worn or damaged journals. That's tough on your ropes, too.

It's easy to realize the jerk or shock at the fastening when a wire rope whips. Vibration has the same kind of effect, building up a great many small shocks. Too much play in the rope may be to blame...even a bent shaft.

Check for displaced or faulty rope guards. Then find out from the operators if there are any clutches that stick or grab...loose bearings or anything else that causes the pull on a rope to be uneven or jerky.



And remember to consult your wire rope manufacturer on any special problems. There are local representatives near you who have practical experience in ferreting out any "bugs" in your equipment that may be keeping your wire ropes from delivering a maximum of service."

JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY
Branches and Warehouses in Principal Cities

ROEBLING
"Blue Center"
STEEL WIRE ROPE
PREFORMED OR NON-PREFORMED

Actual photo of a Gulf engineer consulting with Superintendent on the lubrication of quarry equipment.

"GULF QUALITY LUBRICANTS HELP US PRODUCE MORE TONS PER HOUR"

says this quarry Superintendent

"With proper lubrication we get efficient, full capacity performance from our equipment and avoid time out for repairs."

"SOME time ago we adopted a lubrication policy that has paid us big dividends," says this quarry Superintendent. "First we called in a Gulf engineer and standardized on the quality lubricants and application methods he recommended. Then we put into effect close supervision of our lubrication, to make sure that Gulf Engineering recommendations are carried out. Result: We maintain all our equipment in good condition and avoid unnecessary delays, which add up to *more tons per hour.*"

To meet unprecedented demands for production, every quarry and plant depend on uninterrupted service from important units of equipment. Breakdowns interfere with production schedules —and are particularly serious today, with spare parts so difficult to obtain. More than ever, you need the protection afforded by the best lubrication practice—the kind of lubrication practice you can install by following Gulf Engineering recommendations. Investigate — call in a Gulf engineer now and ask him to recommend the proper application of lubricants exactly suited to each piece of equipment and each moving part. His knowledge and experience can profitably be applied to your problems.

The services of a Gulf engineer—and the Gulf line of 400 quality oils and greases—are quickly available to you through more than 1200 warehouses in 30 states from Maine to New Mexico. Write or 'phone your nearest Gulf office today.

GULF INDUSTRIAL LUBRICATION

GULF OIL CORPORATION · GULF REFINING COMPANY
GULF BUILDING · PITTSBURGH, PA.

The Nation's Quarries Are Remembering Pearl Harbor

Armed with a grim determination, the quarries and cement plants of the Nation have mustered their man and machine power in an all-out war effort. A powerful influence on the final results are the hundreds of MARIONS actively engaged in digging and loading these vital materials. Maximum yardage is Marion's way of saying, "VICTORY will be ours."

THE MARION STEAM SHOVEL COMPANY
MARION, OHIO, U. S. A. *Offices in all principal cities*
Serving industry since 1884

MARION

SHOVELS • DRAGLINES • CLAMSHELL
CRANES • PULL-SHOVELS • WALKER
Gasoline — Diesel — Electric — ¾ cubic yard to 35 cubic yard

FOR

DOWNRIGHT ECONOMY

PER YARD OF STOCKPILE MATERIAL HANDLED, THE

BUCKET LOADER

IS 'WAY OUT IN FRONT, EVERY TIME!

Haiss has specialized, from the start, in serving operators who based their equipment purchases on net-economy-over-years-of-service. When this war is over every sand, gravel and stone producer is going to be compelled to strive for net-handling-economy as a basis of operating profit. With both highly-mobile "wheel" types and creeper model machines, Haiss is going to have "preferred" equipment in all capacities from 2 to 8 yds. per minute. Catalogs on request.

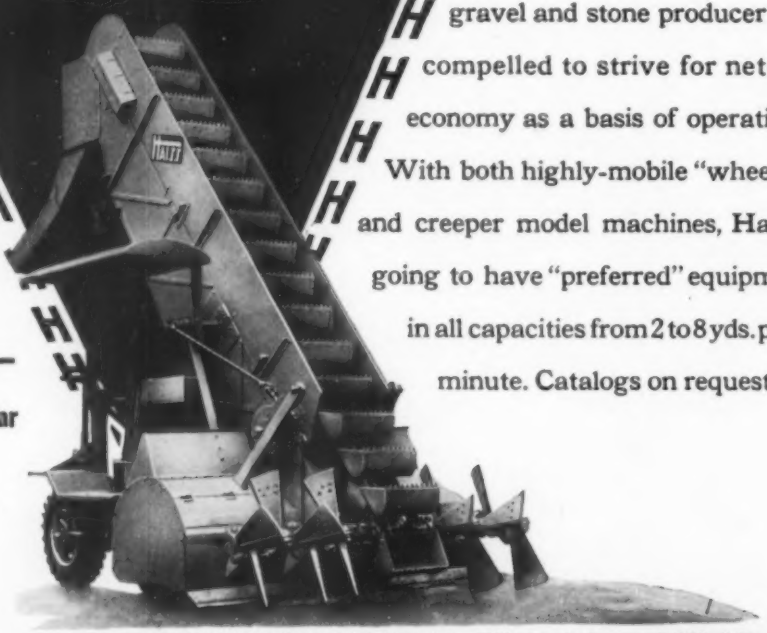
MORE WORK per Lb. of Weight

MORE CAPACITY per Dollar Invested

MORE OUTPUT per Gallon of Fuel

MORE YARDS per Maintenance Dollar

MORE YEARS of Every-day Service



GEORGE HAISS MANUFACTURING CO., INC., Park Ave. and 143rd St., New York City

HAISS QUALITY EQUIPMENT FOR 50 YEARS 1892 ★ 1942

HAISS

PORTABLE CONVEYORS ★ LOADERS ★ CLAMSHELL BUCKETS

LITTLE KNOWN CHARACTER OF LIME AND LIMESTONE

AT OUR SUGGESTION a friend was asked to write an article for a chemical journal on "Lime as a Chemical Raw Material." He's done a fine job in the space allowed, because he has concentrated on the *functions* of lime rather than its infinite variety of uses in the arts and industries. A large volume could and should be written on this subject; but if written now it would bare a great lack of knowledge as to the *why* of many results in industry from the use of lime.

There is no native mineral that we know of which offers a larger or more interesting field for study and research than limestone and lime. However, to fully explore this subject would require the collaboration of the geologist, the geochemist, the industrial chemist, the agricultural chemist, physical chemist and the minerologist. A very considerable amount of study and research has been done, but its practical value is little at the present time for want of the services of a skillful coördinator and generalizer, sufficiently versed in the various sciences to be able to pick out and coördinate relevant and significant material.

Every one knows that limestones differ from one another; that no two deposits are ever identical. Their differences in mineral composition, or impurities, are readily recognized. That is about as far as the ordinary cement or limestone plant chemist or owner goes. And that is just about as far as any industrial user's specification for the purchase of limestone or lime goes. Chemical analyses in every-day use generally cover only a few of the more important impurities—that is those considered important because they are the most abundant.

Much speculation has gone on through the years as to the effects of small amounts of other impurities on the properties of the stone, or the lime, but actually very little is known. Unfortunately these are only a few of the many factors that may affect the character of limestone. That is why so much research is necessary to find the reasons behind known differences in the properties of lime and limestone.

If we had an exposed quarry face of limestone, or dolomite, the first thing we would want to know is how many distinct stratifications or layers are there. We would like to find out the geological origin of each. We would like to know how to identify them in various parts of the quarry; we would like to have the most complete mineralogical and chemical analyses made of each stratum; and finally, of course, we would like to have some way of determining what each stratum, or a mixture of all the strata, is best suited for.

Provided we had this information, it would be only a starter, for if we are going to make lime, we want to know how to burn it right for one or more lime products; if we are going to grind it for whiting or other very fine mineral product for special uses, we want to know the best type of grinding mill for the particle size, shape and distribution of sizes, most desirable in the product. If we are making agricultural limestone we want to know enough biology and animal husbandry to be able to capitalize on any traces of rare elements our stone contains—cobalt, copper, manganese, iron, iodine, etc., since all these are vital to animal and plant life and health.

We suggest these things not only that producers may possibly specialize and make more profits, but because it will give them a vastly greater interest in their work and profession. You don't simply go into your quarry and pick up a piece of rock and say, "this is limestone." You want to know, was it of chemical, plant or animal origin? Is it the calcite or aragonite form of calcium carbonate, or a mixture of both? This is important, although seldom taken into account by the lime or limestone producer. For example calcite, in a solution of ferrous sulphate, produces a *yellow* precipitate of *ferric* hydroxide; aragonite produces a *dark-greenish* precipitate of *ferrous* hydroxide. Why?

Aragonite is more soluble and is therefore much less common than calcite. Does that solubility carry over into lime made from aragonite? Who knows? Limes do vary greatly in solubility. Often the more soluble, the better service it renders. How can we change one form of carbonate to the other? It is possible now to make precipitated calcium carbonate as aragonite from a suspension of hydroxide (or hydrate). Presumably, because of its greater solubility, calcium carbonate in the form of aragonite would be preferable for agricultural limestone and for poultry grits and animal feeds.

If we found a special field or market for very pure calcium oxide, or calcium hydroxide, which to the lime manufacturer means lime and hydrated lime, we would not be satisfied by merely looking for a stratum in our quarry particularly low in impurities. We would explore methods of ridding it of all impurities—flotation for example, or we would burn and hydrate the lime, air separate it and burn it again. That last process is obvious, but it has been patented as a process for purifying limestone for cement manufacture by Breerwood (see ROCK PRODUCTS, August, 1941).

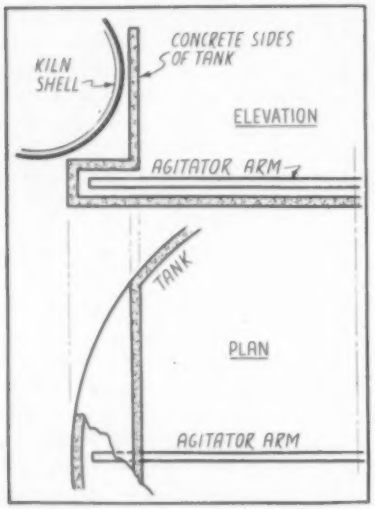
Nathan C. Rockwood

HINTS AND HELPS

Off-Set Agitator Tank for Slurry

By WALTER B. LENHART

AT THE PERMANENTE cement plant near San Jose, Calif., the installation of the fourth kiln made it the largest cement plant in the world. To get



Plan and cross section of concrete slurry tanks sliced off to make room for another cement kiln

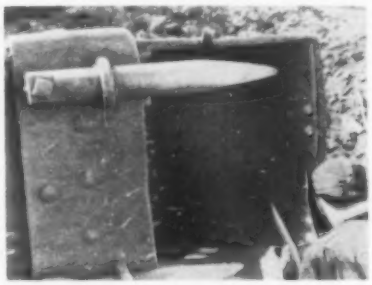
in this fourth kiln meant that the slurry storage tanks (concrete structures) would have to be moved to make room for the installation. Moving the tanks was undesirable so they were re-designed to fit into the scheme of things.

The side of the tanks nearest the kilns was sliced off from the top down to within a few inches of the top of the agitators. The bottom and circular section wherein circulates the agitators was kept circular. This gave the side of the tank next to kilns an "L" shaped section so that no change in the agitator arms was needed, and the kiln was installed through the upper part of the "L" section.

Restoring Worn Teeth to Clamshell Bucket

By ROBT. A. HARKER

IN THE ACCOMPANYING ILLUSTRATION may be seen the method employed to restore worn or broken teeth to a clamshell bucket. Old shafting or similar stub ends of steel, frequently discarded, are used for this purpose. The view shows a 1¼-cu. yd. Blaw-Knox bucket equipped with teeth which have been hand-forged in the plant shop and fastened to the bucket by a U bolt in the midsection and a machine bolt at the back end, using



Hand-forged teeth for clamshell bucket, the ends of which have been hardened with a special welding rod facing

the original holes in the lip formerly used for a factory-made manganese tooth.

The success of these teeth has been proven by handling about 20,000 tons of rock asphalt with them. It is advisable to coat the points with a hard facing material, such as Stoody self-hardening rod or Stoodite. If this special welding rod cannot be obtained, it is believed that cast iron rod would make a good facing material for such a job, but the writer has not tried this material. However, a local contractor is using cast iron facing on his bulldozer blades, electrically applied.

These narrow teeth are very good for scarifying our rock asphalt which "sets up" to some extent. It is possible a wider tooth may be needed under some conditions.

Gate-Controlled Master Chute for Eight Bins

IN THE ACCOMPANYING ILLUSTRATIONS may be seen an unusual bin control scheme worked out by the Blue Ridge Stone Corp., for their Blue Ridge, Va., plant.

Material from the bucket elevator passes over two 3-deck screens and passes into a master chute where

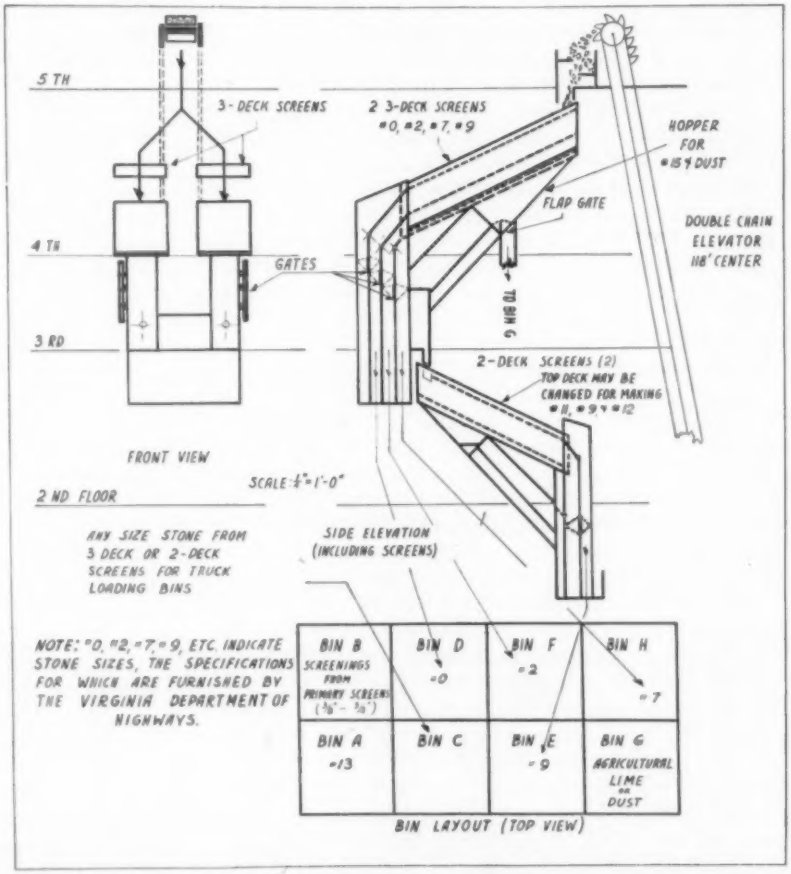
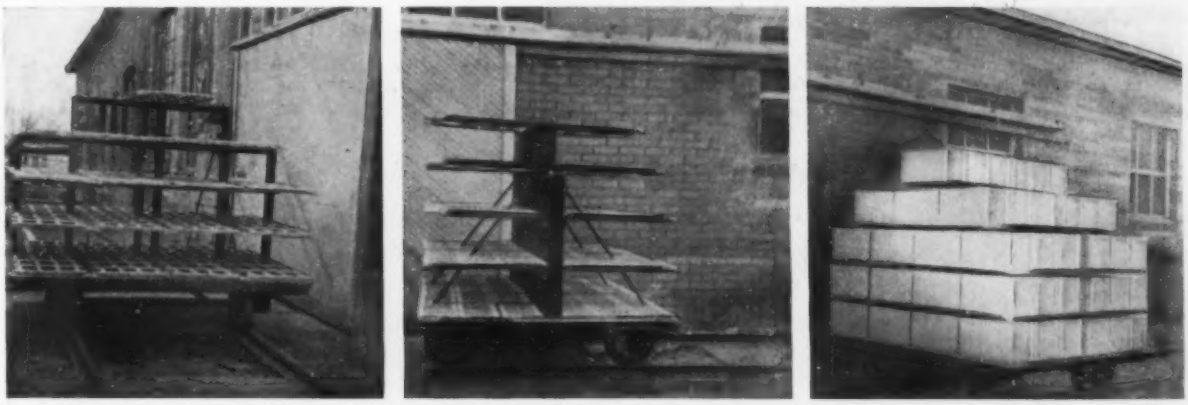
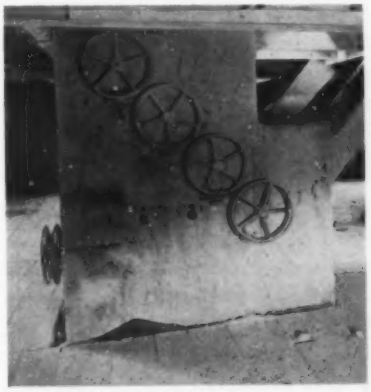

5 TH
4 TH
3 RD
2 ND FLOOR
3-DECK SCREENS
2 3-DECK SCREENS #0, #2, #7, #9
HOPPER FOR #1 & 9 DUST
FLAP GATE
DOUBLE CHAIN ELEVATOR 118' CENTER
GATES
TO BIN 6
2-DECK SCREENS (2) TOP DECK MAY BE CHANGED FOR MAKING #11, #9 & #12
FRONT VIEW
SCALE: ¼"=1'-0"
ANY SIZE STONE FROM 3 DECK OR 2-DECK SCREENS FOR TRUCK LOADING BINS
SIDE ELEVATION (INCLUDING SCREENS)
NOTE: #0, #2, #7, #9, ETC. INDICATE STONE SIZES, THE SPECIFICATIONS FOR WHICH ARE FURNISHED BY THE VIRGINIA DEPARTMENT OF HIGHWAYS.
BIN B SCREENINGS FROM PRIMARY SCREEN (⅜" - ⅝")
BIN D #0
BIN F #2
BIN H #7
BIN A #13
BIN C
BIN E #9
BIN G AGRICULTURAL LIME OR DUST
BIN LAYOUT (TOP VIEW)

Diagram showing elevation and plan details of gate-controlled master chute and screens



Left: Looking at pyramided welded rack from the end. Center: End view showing struts. Right: Showing block arranged on rack

wheel-operated gate controls direct materials into various truck loading bins and over two 2-deck screens.



Showing gate controls of master chute

The diagram shows the operation of the controls and the flow of material into the different bins, below.

Portable Crusher for Housing Contract

THE QUARTZITE STONE CO., Lincoln, Kans., has moved a portable stone crushing plant to Towanda where the company has a contract for crushed rock to be used in paving and other concrete work on one of the housing projects at Wichita. Excessive rain in the fall delayed the work.

Maximum Block Capacity With Pyramid Rack

IN THE ACCOMPANYING ILLUSTRATION is shown a rack which has been designed to provide maximum block capacity in a high pressure steam curing cylinder. It was developed by J. Morley Zander of the Saginaw Brick Co., Saginaw, Mich.

The rack is made up of welded angle iron sections with a heavy, centrally-located vertical division, pyramiding at the top, from which the horizontal sections on which the block are placed are supported. Steel struts, extending at an angle from near the top of the central vertical member to the outer ends of the bottom shelf of the rack, give rigidity to the assembled rack. It will be readily noticed that this arrangement gives maximum rack carrying capacity inside the curing cylinder. The rack holds 96 8- x 8- x 16-in. block.

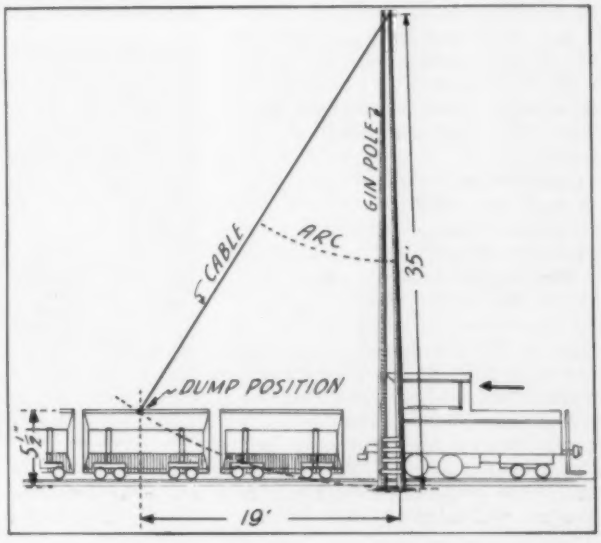
Quick Dumping of Industrial Cars

B. V. HEDRICK GRAVEL AND SAND CO., Lisleville, N. C., uses 12-cu. yd. side-dump cars to deliver pit-run material to the plant receiving hopper. Dumping operations have been speeded up by the use of a simple 35-ft. vertical gin pole and a length of wire rope.

As a car is backed up close to the hopper, a clamp on the end of the cable (hanging vertically from the gin pole) is engaged to a clevis on the car. As the car is then pushed alongside the hopper, the cable is in

Dumping loaded car

tension and describes an arc, thereby raising the body of the car into the dumping position. This requires a vertical movement of about 5½-ft. which corresponds with a horizontal movement of 19 ft. of the car. The gin pole is therefore located about 19 ft. from the hopper.



Showing use of gin pole and cable to dump cars

MERCHANDISING

Recover Special Sands and Gravel

And sell the products under Trademark. Increase market by the production of bituminous road mixes

BACK in 1932, when the Eau Claire Sand and Gravel Co., Eau Claire, Wis., built its plant it was described in ROCK PRODUCTS, March 12, 1932, pp. 88-90, as the first "standardized" sand and gravel plant. It was designed by the J. C. Buckbee Co., Chicago. By standardized is meant that the plant had capacities and size requirements comparable to those that were average in other contemporary plants, of 1500 tons in 10 hr. and four sizes of material.

To meet competitive conditions, the plant was built of all-steel construction in sections so that it could be dismantled easily and bolted back together by the plant crew with the help of a locomotive crane.

Compact Plant Arrangement

Plant arrangement was compact and simple. A Monighan Diesel dragline was used to excavate a deposit in the Chippewa River, a 20-ton locomotive and 8-cu. yd. Sanford-Day drop-bottom cars transported the material to a field hopper, and a 30-in. conveyor belt delivered the material into a revolving scrubber-scalper screen at the head of the plant.

Oversize was put through a 7-in. suspended Newhouse gyratory crusher and sizing was done over a 4- x 8-ft., 3-deck vibrating screen. Minus ¼-in. material was put through a twin-screw washer to produce concrete sand and the overflow was wasted.

During eight years of operation, the plant has not been moved and is unchanged, but in connection with it there is operated a dry sand plant, a ready-mixed concrete plant, and one for bituminous mixes. The last two named were recently built.

Gravel in the deposit, about 40 percent of the total, is a very hard, rounded flint, which is much harder on crushing equipment than ordinary gravels but is very favorable for special uses such as filter gravel. Sand is of granitic material and is likewise well-adapted for special uses. It has the same characteristics as other sands in that part of the country in that it leans toward the coarse. Maximum 100-mesh fines are only one or two percent, and much of the 60-mesh to 100-mesh size range is washed out in handling through ordinary classification equipment.

A masons sand is now produced by insertion of a simple launder screen section. The dry sand plant gets its feed by running sands from the classifier down a launder into a large settling area adjacent to the dry sand plant. Simple wooden settling boxes in the launder catch fines which would ordinarily be washed out in producing concrete sand. A crane handles the settled material into the dry plant where it is put through a rotary dryer and screened

Above: Bituminous road mix plant with batcher and pug mill on platform to the right, and to the left, below, is the reduction crusher which provides a cubical shaped aggregate. Below: Close-up of crusher being adjusted by hydraulic means

Left: Bituminous mix plant which receives gravel by locomotive crane and the elevator discharges over screen. Right: Standardized sand and gravel plant of steel sections which may be taken down and reassembled at a new location

over Ro-top screens into various products to various specifications. Among these products are many grades of filter sand, engine sand, and sand blast sands which are shipped into 42 states.

These sands are sold under the trademark "Red Flint." A recent outstanding job using "Red Flint" sands was the new Milwaukee filtration plant. As part of its merchandising effort, a glass-faced panel has been prepared showing in vertical section how the sands and gravels of various sizes are graded up in size from top to bottom over water piping in a filtration plant. These panels are on display in all leading universities.

Add Crushing Equipment for Bitumen Mix Plant

Bitumen mixes, produced in a plant built early in 1940, provide an outlet for surpluses of ¾- to 1½-in. concrete gravel. The plant consists of a crusher, a 2- x 6-ft., double-deck Simplicity vibrating screen, small bins for sized material and a pug mill for mixing in the bitumen.

These mixes are cold mix, of 100 percent gravel available in four sizes from course to a fine sealcote for surfacing driveways, etc.

The plant is located in the stock-piling area. A locomotive crane handles the feed stone which is a combination of rounded, partially crushed and fully-crushed gravel, into a small bin over the crusher. The crusher is one of the recently-introduced Allis-Chalmers 322 type R reduction crushers. This is a small, high-speed gyratory designed to crush to cubical shape and, with a minimum of elongated pieces. It is operated in closed-circuit with the screen through a bucket elevator and has a provision for returning oversize into the crusher through a chute. This machine has a built-in, oil-filled hydraulic jack supporting the thrust bearing which holds the crushing head in position. By injecting or releasing oil, the head and shaft are raised or lowered to adjust the discharge opening when changing size of product.

Typical sizes produced for asphalt mixes are ¾- x ⅜- or ½-in., ⅜- x 6 mesh and 6 mesh to 200 mesh, which is used for topping. The crusher is driven through Texrope by a 35-hp. electric motor but actually requires far less power. Minus ¾-in. 100 percent crushed gravel is produced at the rate of 35 tons per hour with an actual power input of 22 horsepower. A ⅜-in. product consumes 30 hp. Crusher settings are 5/16 when producing ⅜-in. material and ½ in. for ¾ in. gravel in order to hold down the returns into the crusher. Two sizes are produced simultaneously and mixed with the bitumen in a pug mill.

Trademarked Road Mixes

"Flintite," as the bituminous mixtures are trademarked, is being pushed by the company's sales force and is finding wide acceptance in Eau Claire, a city of 32,000, for driveways in filling stations and homes, for patchup work, and for some paving and miscellaneous work. It is sold through contractors but also by the company direct, particularly for small work where there is no contractor or where the contractor doesn't wish to handle it.

For laying the surface, the company has its own crew, usually plant men, and all the necessary equipment, including spreaders and rollers. Trucks having regulation end-dump bodies are used for the haul. Sealcotes are available in any colors using patented colored granules.

New Gypsum War Product

NATIONAL GYPSUM CO., Buffalo, N. Y., has developed new war uses for gypsum outside the building field, which, when fully perfected, will tax its manufacturing facilities.

The exact nature of these new products cannot be revealed, however, because of their connection with the war program. In one of these new products, gypsum is used as a chemical base with startling results.

This product now is undergoing extensive tests and, if approved, will require a substantial tonnage of the company's gypsum output.

In at least two other instances, National Gypsum Co. is supplying gypsum companies working on products going into the war program. It is anticipated that shipments to these manufacturers will increase sharply in the coming months.

Sub Attacks May Stimulate U. S. Gypsum Operations

ONE OF THE FOUR SHIPS operated by United States Gypsum Co. was lost in collision recently off the East coast, and if sub attacks should further cut down shipping, the company will produce more of their products from the Oakfield, N. Y., plant, according to Sewell Avery, chairman of the board. All plants are running at capacity.

Water Supply Needed

WATER is the most vital war material. Just about all industrial processes must have it in fantastic quantities. For example, it takes 100 gallons of water to produce one pound of smokeless powder.

CLINKER COOLING

Collecting Rotary Cooler Dust

Air quenching of clinker improves cement soundness, increases finish mills output, and reduces fuel consumption

By BROR NORDBERG

ANOTHER CEMENT MILL that has gone to rapid air quenching of clinker and after-cooling preparatory to grinding into cement is the Bay Bridge, Ohio, plant of the Medusa Portland Cement Co.

The installation of clinker cooling equipment finished in 1940 follows complete rebuilding of the finish mill in 1938 (ROCK PRODUCTS, May, 1939, pp. 20-22) and the principal reason for so equipping the kilns was to chill the clinker more efficiently as well as to replace obsolete with modern cooling equipment.

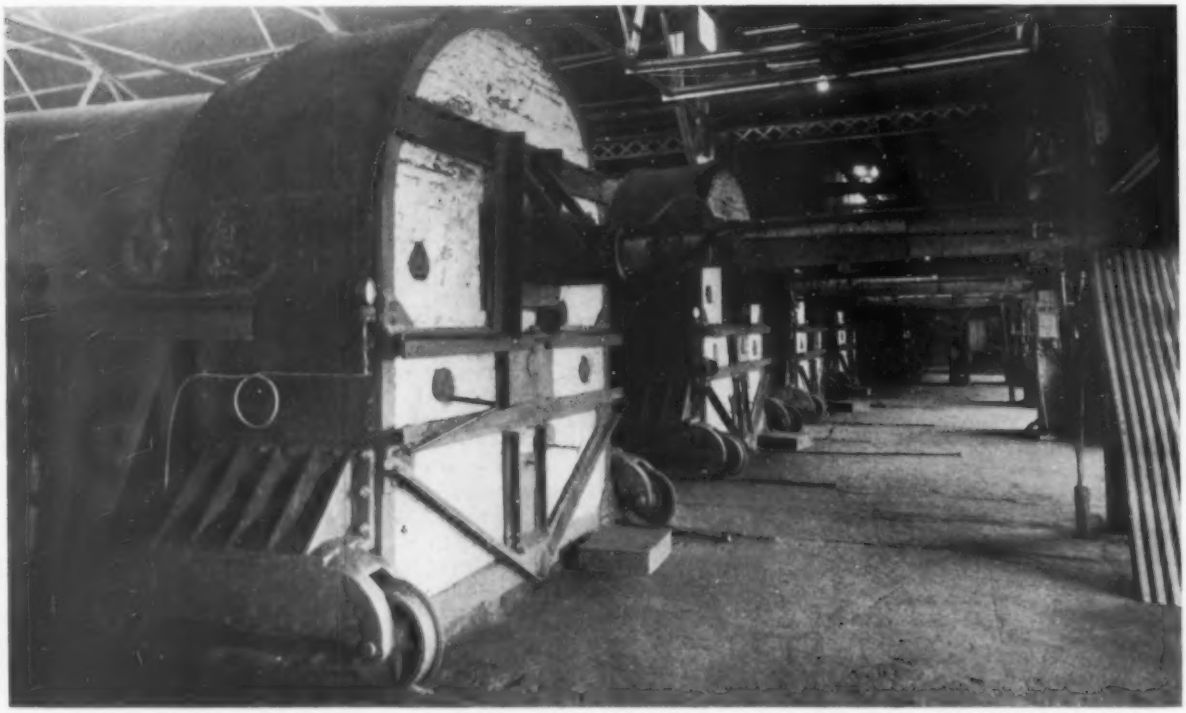
The Bay Bridge plant originally had eight 8- x 100-ft. rotary kilns. Two are now out of service: one was dismantled several years ago and the other has been converted into a rotary secondary cooler in connection with the new modernization program. Now the plant has six operating kilns and a production of 3000 bbl. of clinker a day.

Until 1940, each kiln had, underneath it, a 4- x 40-ft. rotary cooler and all the clinker discharged on to a common McCaslin conveyor which discharged into the grinding mill feed bins. Water sprays played on the clinker, but cooling was inadequate for direct handling into the grinding mills at high capacity. Clinker was introduced into the grinding mills at temperatures up to 350 deg. F.

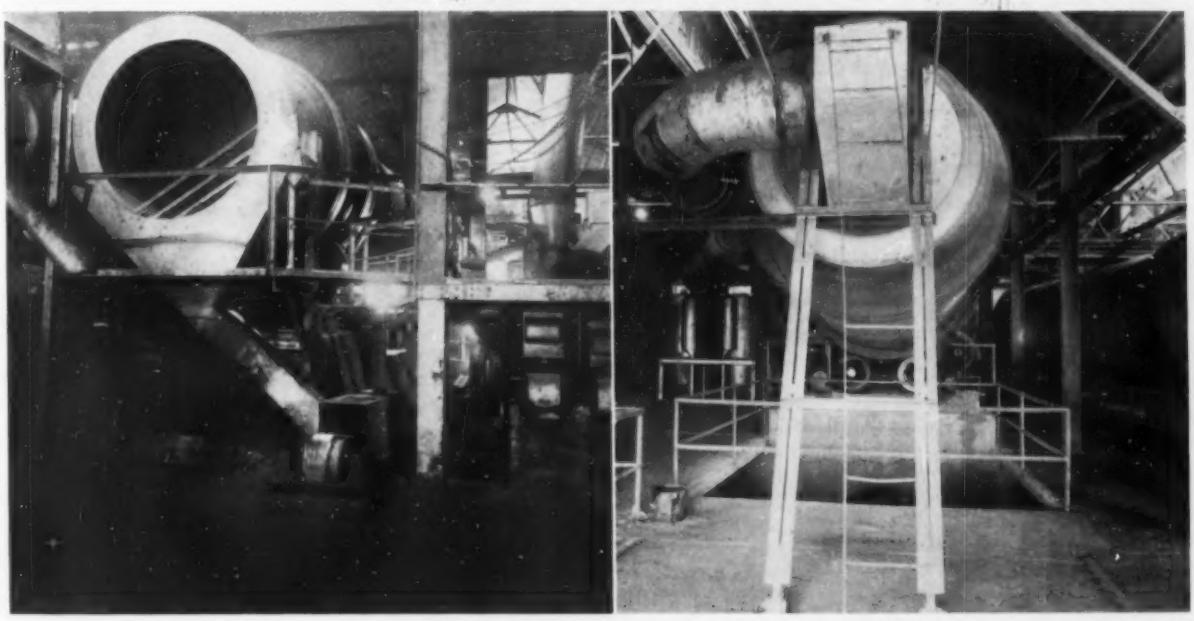
The four kilns have been equipped with the new type S Vanderwerp recuperator, and the clinker from all kilns is cooled down to more ideal grinding temperatures through a single rotary cooler. This revolving cooler was made from a kiln and is 8- x 85-ft. with division plates the full length to divide the clinker. The shell is in its original space in the kiln room, but was cut off, and the trunnions were raised for a slope of ¾-in. to the foot.

All the small rotary coolers were discarded and a continuous Peck conveyor was put in under the kiln discharge ends to elevate and drop the clinker into the single revolving cooler. The same continuous conveyor is the means of placing clinker, as produced, into the grinding mill feed bins, with a short belt conveyor inserted to carry clinker from the cooler to the McCaslin conveyor.

Clinker now drops on to the Peck conveyor, direct from the kilns, at 800 deg. F. and discharges from the revolving cooler at 100 to 120 deg. F. Cooling air is pulled through the cooler, counter-flow, and through a



Six operating kilns equipped with an improved type of heat recuperator to air-quench clinker, aiding grinding efficiency



Left: Discharge end of 8- x 85-ft. rotary secondary clinker cooler made from an old kiln. Right: Feed end of secondary cooler. Note dust collector pipe running back to collector to the left, in the background

Parsons "Parclone' collector to rid it of dust before exhausting. The collector operates under suction and consists of four cyclones that empty on to the McCaslin clinker conveyor on the next floor below. About ½ ton of clinker dust is recovered each hour.

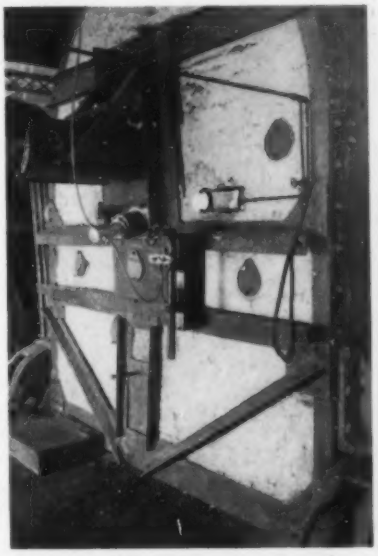
The McCaslin conveyor has been fitted with a Merrick weightometer which is used to record the clinker tonnage produced and as a check on the efficiency of the operating burners. It gives the burner an opportunity to check on his own ability to burn clinker and is read at the end of each shift, for a record of production.

Air quenching of the clinker has improved the cement soundness as measured by the autoclave expansion test, but, more important at this mill, has materially increased the output of the finish mills and there has been a saving in coal consumed since the secondary air for combustion is now preheated.

Grinding capacity for each of two Hercules preliminary mills, on clinker, is up from 130 bbl. to 140 bbl. per hour, based on production records for a full year of operation. Changing the discharge screen openings in these mills from 14-mesh to 16-mesh, with the handling of a more grindable clinker, has proportionately increased the finish grinding capacity through tube mills. Production of four 5- x 22-ft. tube mills paired in closed-circuit with two mechanical air separators is now 45 bbl. of cement per hour each.

During 1940 this plant began the production of high early strength portland cement (Medeo); also masonry cement (Brikset) which means that the increase in grinding capacity is even more favorable.

Bay Bridge is a wet process plant with marl as a raw material and is a waste heat operation. Coal consumption has been reduced about 10 lb. per bbl. for burning clinker, but 2 or 3 lb. have been added, on the other hand, for generating power.



Kiln equipped with radiation pyrometer for recording temperatures on a recording potentiometer

Raw mill production also has been increased by the installation of two 3- x 10-ft. Robins vibrating screens which are in closed-circuit with kominuter preliminary mills. These were put into operation to more accurately define the top size of preliminary mill product which becomes the feed for 5- x 22-ft. tube mills.

By removal of the "spitzers" from the tube mill feed and increasing the fineness from 96.5 percent minus 20-mesh to 96.6 percent through the 20-mesh, the tube mill product has increased per mill hour to 39.8 bbl. Only four of seven tube mills now need be operated. Raw material is ground to 98.1 percent minus 100-mesh and is fed into the kilns as a cake containing 25 percent water.

Unusual Red Granite

PREMIER GRANITE QUARRIES, Llano, Texas, operated by C. R. Stolz, is said to be one of the best equipped granite quarries in the world. Although its principal business is the production of an unusual shade of red granite for monuments and other dimension stone purposes, found elsewhere only in Finland, the company also does an extensive business in jetty stone. The plant is equipped with two gang saws, one rotary shot saw, two automatic polishers, five conventional type polishers, and operates its own Diesel power plant.

Effect of Admixtures On Portland Cement

Article 2. Studies of calcium salts and alkali salts used as admixtures

By CHAS. H. JUMPER* and GEO. KALOUSEK*

● *The effects on changes of temperature with time and on time of set of five groups of salts and compounds added to mixtures of cement clinker in water were investigated. Aluminum, alkali, and calcium salts, a group of miscellaneous inorganic compounds, and a group of organic compounds were added in varying amounts to three cement clinkers and the changes in temperature effects and time of set are compared with those of untreated clinker-water mixes. A group containing gypsum plus other admixtures is included.*

FOREWORD

IN THE FIRST ARTICLE, in the April issue, the authors described the equipment and conditions involved in the laboratory experiments with three different clinkers. The temperature of cement pastes made from these clinkers, to which various soluble salts were added, were determined during the first 24 hours after mixing. As a result of these studies, it is believed that better knowledge of the thermal effects during setting and hardening will materially assist in finally elucidating the setting and hardening phenomena. Table 1, giving the chemical analysis of the three clinkers, is repeated for reference purposes. The first part of Table 2, showing temperature effects and time of set of the clinkers with aluminum salts, appeared on page 55 of the April issue.

Calcium Salts (Group 2)

The addition of different calcium salts to the clinkers produced a variety of changes in the acceleration and retardation of reactions, and in the times of set.

Calcium acetate uniformly increased the time required to attain a maximum temperature, caused a lowering of the 1-hour temperature in clinker 2, an increase in clinker 3 and no change in clinker 1. The setting of the pastes was retarded in all the tests.

The addition of small amounts of $CaCl_2$ resulted in a lower 1-hour temperature rise for clinkers 2 and 3, but with increasing quantities of the salt progressive increases in the 1-hour temperature rise were obtained, which finally exceeded those of the untreated clinkers when 2.0 and 1.5 percent were added, respectively. The maximum temperature rises, which were in all cases higher than those of the corresponding clinkers, approached constant values after the addition of about one percent of the chloride. Also, the times of set, which were decreased considerably, became nearly constant for clinkers 1 and 2. Calcium chloride was a vigorous accelerator of set, but when added in smaller amounts lowered the 1-hour temperature rises of clinkers 2 and 3. No flash (quick) sets were observed during the mixing period of one minute.

Calcium iodide and nitrate, added separately to clinker pastes, lowered the 1-hour temperature rise of clinker 2. When present in larger amounts these salts decreased the times required to attain the maximum temperature rises of the three clinkers. The times of set were retarded but slightly.

Although plaster of Paris, $CaSO_4 \cdot \frac{1}{2} H_2O$, is about four or five times as soluble as gypsum, its solubility compared to the above salts in this group is relatively small. The temperature changes induced by the addition of plaster of Paris as shown in Table 2 are similar to those for gypsum. The times of set of clinkers 1 and 3 were delayed by addition of plaster, particularly the initial set of clinker 3; however, clinker 2 with plaster showed an early initial set.

A commercial preparation of plaster and tannic acid was used; the results obtained by the addition of plaster alone and plaster plus tannic acid were practically the same.

Gypsum, as a component of portland cement functioning both as a retarder and accelerator, was unique among the calcium salts in this study because of its low solubility. The amount of sulfate calculated as the calcium salt in solution was about 0.07 percent of the weight of cement for the mix used.

The outstanding change produced by addition of gypsum was found in the lowered 1-hour temperature rises except with clinker 1; however, it is to be noted that this clinker, untreated, had a very low 1-hour temperature rise. All thermal effects for mixes containing more than 0.5 percent of gypsum tended to be the same, as also were the times of set. An examination of the times of set showed clinker 1 to be practically unaltered, clinker 2 was accelerated, and clinker 3 was slightly retarded only in the initial set by gypsum.

The lowering of the 1-hour temperature rise of the clinker pastes by the addition of gypsum showed that

*National Bureau of Standards.

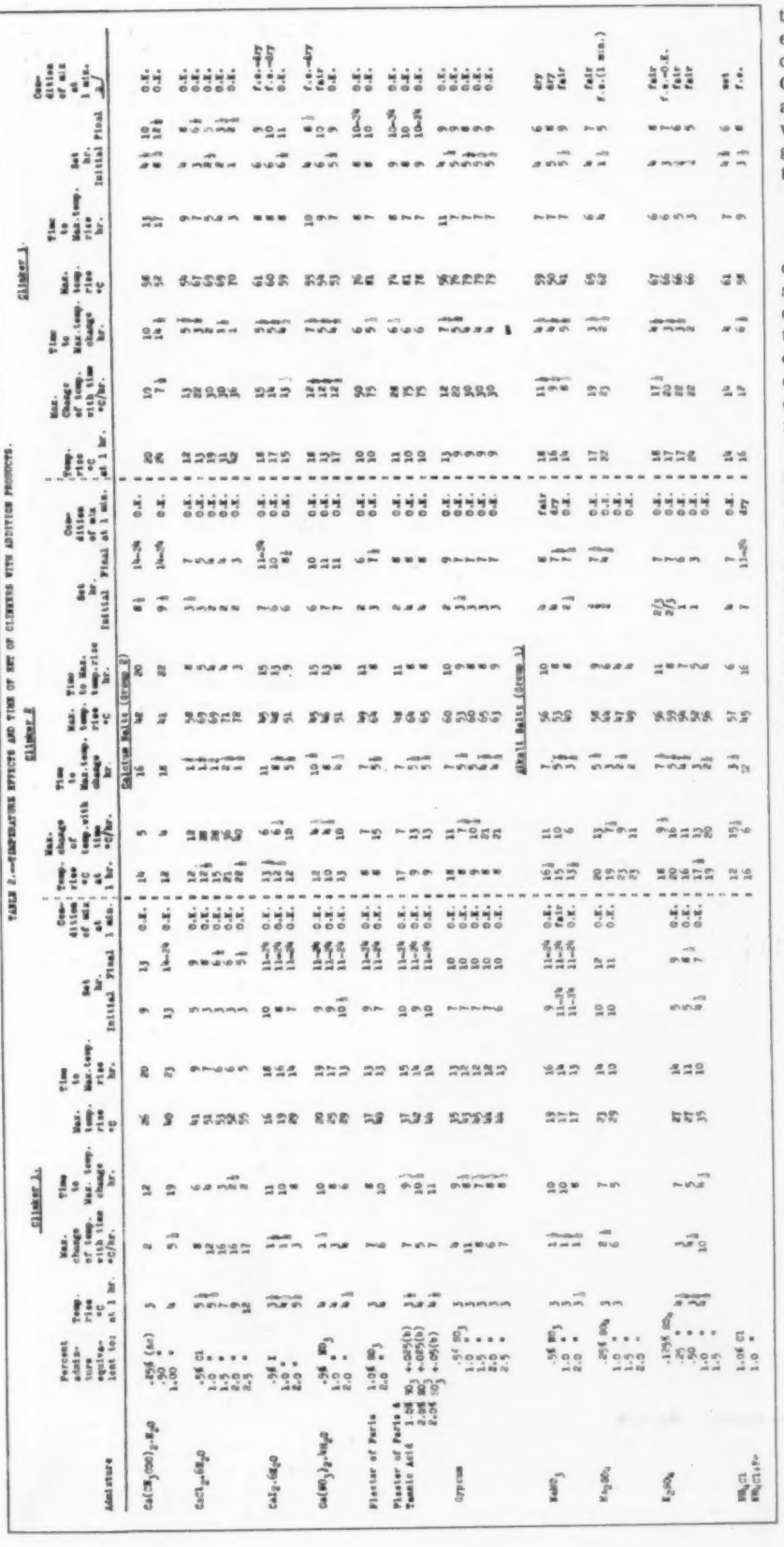
[1] The numbers in parenthesis refer to literature citations at the end of this paper.

TABLE 1. CHEMICAL ANALYSIS AND CALCULATED COMPOUND COMPOSITIONS OF THE CLINKERS

Clinker	No. 1	No. 2	No. 3
SiO_2	20.5	21.8	19.5
Al_2O_3	6.8	6.7	7.0
Fe_2O_3	3.5	2.2	2.5
CaO	63.9	64.4	66.2
MgO	2.1	1.7	3.3
SO_3	0.1	0.4	0.6
Ig. Loss	2.5	1.4	0.5
Na_2O	0.11	*0.19	0.16
K_2O	0.70	*0.19	0.15
Insol.	0.3	0.4	0.4
Free CaO	1.9	2.6	3.1
C_3S	45	36	56
C_2S	25	35	14
C_3A	12	14	14
C_4AF	11	7	8

*Alkali determinations made on a clinker of the same brand as No. 2.

TABLE 2.—TEMPERATURE EFFECTS AND TIME OF SET OF CLINKERS WITH ADDITION PRODUCTS.



the reaction was moderated considerably, but the lowering did not accompany changes in time of set. Clinker 3, a quick-setting clinker, had a high initial temperature rise which was decreased by the addition of gypsum, but no appreciable change in the time of set was evident.

Alkali Salts (Group 3)

In general, the one outstanding characteristic of pastes containing sodium nitrate was the progressive decrease of the maximum temperature rises with increasing percentages of the salt. The times of set of the clinkers compared with changing concentrations of the salt, exhibited irregular behavior.

Pastes containing sodium sulfate and potassium sulfate showed very much the same behavior. The outstanding effect of these two salts was the acceleration of setting. The times of initial set of clinkers 2 and 3 were, in general, markedly decreased and the times to the final set decreased with increasing percentages of the salts. The maximum temperature rises in general were higher and occurred earlier than did those of the clinker. Although the 1-hour temperature rise of a paste containing alkali sulfate was nearly the same as that of the untreated clinker paste, the initial set was greatly accelerated by the salts.

Ammonium chloride and Fe + NH_4Cl differ from the other salts in that one of the products, NH_3, was removed from the system. Very wet mixes resulted upon the addition of NH_4Cl, but very dry mixes with Fe + NH_4Cl.

References

(1) P. H. Bates, **Proc. Am. Conc. Inst.** 25, 88, (1930).

(2) R. H. Bogue, **Ind. Eng. Chem., Anal. Ed.** 1, 192 (1929).

Handy Reference

UNITED STATES Department of Labor has issued a "Handbook of Federal Labor Legislation" that should be useful to all rock products producers as a ready reference. It is Bulletin 39, Part II—Labor Laws of General Application; price 30 cents (send to Superintendent of Documents, Washington. D. C.).

There are 150 pages giving the essential parts of the Federal laws relating to wages and hours, child labor, industrial relations, social security, regulation of prison-made goods, restoration of jobs to draftees and reservists, etc.

NEWS ABOUT PEOPLE

New Vice-Presidents

THOMAS J. HARTE, formerly vice-president in charge of sales, North American Cement Corp., New York, N. Y., has been elected executive vice-president of the company, with offices in the Columbia Carbon Building, 41 E. 42nd St., New York, N. Y. Mr. Harte was born in New York City, and entered business as a stenographer for Clarence L. Smith Co., excavating contractors, later transferring to field construction and engineering and then branching into the selling field. In 1919, he joined the sales force of the Atlas Portland Cement Co. In 1923 was appointed district manager of Acme Portland Cement Corp. joining the North American Cement Corp. in the merger of 1926. In 1927, Mr. Harte was appointed assistant general sales manager, and in 1931, elected vice-president and general sales manager and a director of the corporation. He is also a member of Committee on Promotion of Portland Cement Association.

Thomas J. Harte

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EDGAR K. MILLER, formerly auditor of North American Cement Corp., New York, N. Y., has been appointed controller. Mr. Miller entered the employ of Security Cement and Lime Co. in 1908 as a stenographer, was made bookkeeper in 1910 and in 1912 was made auditor and put in charge of accounting. In 1925, when Security Cement and Lime Co. merged with the Helderberg Cement Co. and became North American Cement Corp., he was made auditor in charge of all accounting and tax matters, in which position he has continued until his recent elevation to controller.

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EDWIN S. GUTH, formerly general plant manager, North American Cement Corp., New York, N. Y., has been named vice-president in charge of operations and will be located in the Columbia Carbon Building, 41 E. 42nd St., New York City. Mr. Guth has had a long career in the cement industry, starting as machinist and master mechanic with Ironton Portland Cement Co., then as machinist and mill foreman with Lehigh Portland Cement Co., and master mechanic and chief engineer with Pennsylvania Cement Co. He joined Security Cement and Lime Co. in 1915 as master mechanic and was made superintendent in 1916. In 1925, when Security Cement and Lime Co. merged with Helderberg Cement Co. and became North American Cement Corp., Mr. Guth continued as superintendent of the Security plant until 1934, when he was made general plant manager in charge of all the company's plants, in which position he continued until his promotion to vice-president in charge of operations. Mr. Guth was born in Ironton, Ohio, and is a member of the Southern Engineering Society.

Edwin S. Guth

Edgar K. Miller

Succeeds Father

ERNEST F. BROWNSTEAD has been named superintendent of the Ironton, Ohio, plant of Alpha Portland Cement Co., Easton, Penn., filling the vacancy left by the death of his father, Frank C. Brownstead. Mr. Brownstead is a graduate of the school of engineering at Ohio State University. He served as engineer at the Alpha plant in St. Louis for three years, then transferred to Ironton, where he was associated with his father in operation of the plant.

Promote Permanente Officials

RALPH E. KNIGHT has been appointed chief of engineering and construction, and D. A. Rhodes as chief of plant production and operations at The Permanente Corp. magnesium and cement plants at Los Altos, Calif., succeeding the late Harry P. Davis, who was killed recently in an automobile accident.

Joins OPA

HENRY A. HUSCHKE, manager, Agricultural Lime Department, National Lime Association, Washington, D. C., has taken a leave of absence from the Association to go with the Office of Price Administration.

To WPB

GIBB GILCHRIST, former Texas highway engineer and now Dean of Engineering at the Texas A. & M. College, has taken a 30-day leave to assist War Production Board officials at Washington, D. C., on highway priority matters.

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L. R. BOULWARE, vice-president and general manager of the Celotex Corp., Chicago, Ill., has resigned to go to Washington as special assistant to W. L. Batt, director of the material division of the War Production Board.

New President

EDWARD I. WILLIAMS, the new president of the Riverton Lime and Stone Co., Riverton, Va., succeeding the late William E. Carson, is a native of Charleston, S. C. He graduated in mining engineering from Columbia University, New York City, in 1914. From Columbia he went to Canada where he was employed by the General Chemical Co. in mining and construction activities.

Following his service in Canada, Mr. Williams returned to New York, and on the outbreak of the first world war entered the army and was assigned to Fortress Monroe where he instructed officers in heavy artillery. From the Army, he returned to the employ of the General Chemical Co. and operated two mines in Carroll County, Va., until 1925, when he became smelter superintendent for the Tennessee Copper Co. at Copper Hill, Tenn. From Tennessee, Mr. Williams went back to New York, later worked in Indianapolis, and in 1932 became identified with the Riverton Lime and Stone Co., Riverton, Va. He was made sales manager in 1933, and vice-president in 1941.

Edward I. Williams

Technical Director

J. C. WITT, formerly technical service manager, Marquette Cement Manufacturing Co., Chicago, Ill., is now technical director for the same company.

Explosives Chief

C. E. NIGHMAN, former acting assistant to the director of the Bureau of Mines, has been appointed chief of the explosives control Division in charge of the administration of the Federal Explosives Act. He will act for the director in issuing licenses to qualified makers and users of non-military explosives under an act passed by Congress in the first World War and amended Dec. 26, 1941.

New Cement Plant Superintendents

J.W. GANSER, who has been superintendent of the Dallas, Texas, cement plant of Trinity Portland Cement Co., has become superintendent of the Fort Worth, Texas, plant. Mr. Ganser is succeeded at Dallas by W. O. Stuart, formerly chief electrician.

A. E. FLOWERS, formerly superintendent of the Trinity plant at Fort Worth, has been appointed superintendent of the Consolidated Portland Cement Co. plant at Fredonia, Kans., succeeding Arthur E. Nunn.

ARTHUR E. NUNN has become superintendent of the Signal Mountain Portland Cement Co., Chattanooga, Tenn.

Chief Engineer to General Superintendent

JOHN NARSTED, chief engineer, Canada Cement Co., Ltd., Montreal, Canada, has been appointed general superintendent. Mr. Narsted has been employed in the operating department of the company for 22 years and has seen service at all of its various plants. He has been successively mechanical engineer, assistant chief engineer and chief engineer, having held the latter position from 1935 until his recent promotion.

John Narsted

Manufacturers' Agent

FORREST E. SMITH has resigned as sales manager of Kensington Steel Co. to become a manufacturers' representative for the southeastern States. He will locate at Asheville, N. C., and specialize on crusher and shovel parts, representing the Frog, Switch and Manufacturing Co. and other concerns.

Enters Sales Department

J. W. KENNEDY, engineer, Service Bureau, Huron Portland Cement Co., Detroit, Mich., has been appointed assistant sales manager.

New Directors

W. A. ARMSTRONG, W. D. CONNELY, THOMAS J. DOWNS and W. J. STOFFEL, treasurer of the company, are the new members of the board of directors of Dolese and Shepard Co., Chicago, Ill.

Lime Consultant

WOLF G. BAUER, Williams, Ore., who has done special work for the Roche Harbor Lime Co., Seattle, Wash., and with the Washington Brick & Lime Co., Spokane, Wash., is now assistant to Victor J. Azbe, consulting engineer to the lime industry and consulting editor in charge of ROCK PRODUCTS' "Lime Forum." Mr. Bauer is a graduate of the University of Washington where he specialized in geology and ceramics.

READER COMMENT

British Labour

THIS is not exactly a "Letter to the Editor" in the usual sense. It is an "open letter" to the editor of ROCK PRODUCTS by our good friend, Mr. S. McPherson, editor of *The Quarry Managers' Journal*, official organ of The Institute of Quarrying (Great Britain), published in his February issue. So first we'll have Mr. McPherson's comment, and then we'll write Mr. McPherson an open letter in ROCK PRODUCTS.

* * *

In an editorial by our old friend Mr. Nathan C. Rockwood, editor of that excellent American periodical, ROCK PRODUCTS (December, 1941 issue), he shows that he thinks we are taking our labour difficulties in the quarries too seriously. Note the last paragraph of the editorial which we publish in full here:

"Well, here's a condition that employers of coloured labour in the deep South have always had; and they keep plants operating just the same. Those who eat must work—some."

"Those who eat must work—some." Words of wisdom from a man of long and vast experience; but we believe they were written before our American cousins came right in to the conflagration, and certainly before they had over two years of fighting. When all the labour supposed not to be required for direct war work, and lots that could be, perhaps better, engaged on work either directly or indirectly necessary for the war effort, has been conscripted in America, and when in a quarry there is less than a minimum of men left to carry on the production of stone urgently required by Government Departments, we wonder if Mr. Rockwood and the owners of the quarries will be feeling quite happy and content if their men "work—some." We doubt it.

We have believed for many years that our American friends look on us as staid old men in business. The trait of canniness is not solely confined to the Scots, according to the American idea.

Mr. Rockwood says: " . . . our (American) individualism is of a rather lawless variety . . . " We agree that the Americans seem to have more "push and go." But we do not agree for one moment that with all their rush and hurry they get "there" any quicker than we do. That last paragraph of Mr. Rockwood's clearly says in other words — the quarry owners in the "deep South" have to put up with men coming and going to their work as they see fit, taking days off when they want to, and generally doing as they darn well like, still the quarry executives keep the plants operating just the same. After admitting that "Hitler's hordes are only 20 odd miles across the Channel" (from Britain) he thinks if we only had the guts, the gumption of the American we'd be able to keep our plants going even if our men came and went to work as they wished.

Friend Rockwood, you've got a big surprise waiting for you and any other of your countrymen who think with you, if this war carries on much longer. You credit us with keeping our works going while we're fighting and not so many months ago, fighting on our own, "Hitler's hordes" within some 20 miles of our shores. Still you think we are too slow to keep our quarries at work if our men take days off to go to weddings, and under some such frivolous excuses, when our labour is cut down below the minimum.

We do not think Mr. Rockwood has ever been in Britain. We do know that he promised himself that experience (we fear to say pleasure) some years ago, and we had arranged to give him a good run round, but something, we forget what it was, prevented him from coming. If he had made that trip he might have been very much surprised, as others have been, including a number of Germans whom we were able to entertain in this manner before Hell broke loose, at what we were doing in our slow going, old fashioned (he thinks) way. In any case there is one thing we would say. We are proud to be linked up with America in this war; we are proud to have America's help so lavishly given before they were brought right in to the "fighting zone"; and still so lavishly given. We are proud to welcome the American soldiers who have crossed the Atlantic to help us keep off the invaders if they do attempt to invade us, and we are not too swelled headed, too individualist, or too thick-headed not to welcome any quarry executives America sends us who can show us how to keep plants operating the same when there are not men to operate them as they did when there was no scarcity of labour such as we have here owing to the war.

(And here follows a reprint of the entire December ROCK PRODUCTS editorial.)

* * *

Dear Mr. McPherson:

First of all I want to thank you for having read my editorial, even though I fear it got under your skin in a way I certainly didn't intend or anticipate. I was afraid it was a bit too facetious, in places. Really it was written in a spirit of great admiration for our British cousins and their capacity for continuing to give such serious attention to business details under existing conditions. As a matter of fact I do believe that we Americans consider you Britishers primarily men of business; but that is not uncomplimentary. Consequently, we can't show you much of anything about the business of quarrying. We have already learned a great deal about handling organized labor from you, and probably shall learn a lot more when our labor problem becomes more acute.

However, you Britishers do even now have one great advantage over American quarry operators. Judging by the advertisements in your own journal, you can still obtain quarry machinery "to reduce labor requirements." This in spite of the fact that according to our newspapers your little island is still producing more war equipment than these great United States. Over here, our quarry owners can't buy new equipment for reducing or replacing labor *because* we can't spare (so we are told) the materials or shop space to make it, notwithstanding an obvious shortage of quarry labor in the near future! Evidently we should doff our hats to you Britishers as men of business.

No, Mr. McPherson, I never have been in Britain. It's not only an experience, but a great pleasure, I fondly look forward to. A "run round" or a "run-around" in America means something I don't believe you meant to imply.

Ye Olde Editor of ROCK PRODUCTS.

J. R. Bent

How Middle West Built Up Market For Liming Material

Producer, farmer, and government cooperate through activities of Midwest Agricultural Limestone Institute to create enormous demand

By J. R. BENT*

THE MIDWEST AGRICULTURAL LIMESTONE INSTITUTE is an informal organization of the larger commercial quarry companies in Illinois and adjoining states. It does not maintain salaried officers or clerical help. It has a formal annual business meeting once a year, and numerous special meetings throughout the year. It deals with problems growing out of relationships with other groups such as Farm Bureaus, State organizations, and research and educational work of the Extension Services, and more lately, the Federal Governments Agricultural Adjustment Administration, etc.

As occasion may arise, it deals with matters of mutual interest connected with railroad service; with problems growing out of trucker relationships; with standardization of specifications; with application of various laws to the production, sale and distribution of agricultural limestone; with efforts to correct abuses connected with competition from material produced at state penitentiaries; in short, with any and all problems of mutual interest which may be legally and morally dealt with in an organized way.

In 1937 the Government's Agricultural Adjustment Administration program had reached a point in its development where it began to have a very marked effect in stimulating again the extensive use of agricultural limestone.

The advent of the Government's Soil Conservation program under the Agricultural Adjustment Administration is a major event and influence in the agricultural limestone project. Its activities and effect can best be discussed in connection with the various aspects of the project throughout the remainder of this article.

*Secretary, Midwest Agricultural Limestone Institute.

Sources of Supply

The original sources of supply for agricultural limestone in the Midwest were limited quite largely to the large commercial crushed stone producing quarries. The agricultural material was not a prime product but was, as a rule, a by-product of the crushed stone industry and as such was controlled by no uniform standards either as to chemical purity and grade, or as to screen size, gradation and physical condition. Gradually, however, the research work of the Experiment Stations and the educational program of the Extension Services began to drive home the importance of such considerations. With the establishment of the Illinois Agricultural Association's first limestone department, whose duty it was to give attention to the business and service side of the project, more and more recognition was given to standardized grades and satisfactory quality. Some of the larger quarry operators began to give especial attention to agricultural limestone as a prime product. Here and there low-grade or dirty material was diverted to other uses such as "fill screenings," dressing material for secondary roads, etc. In other cases, where the material had been much too coarse, finer screens were installed. In some cases new machinery was actually installed to supplement the by-product supply by reducing surplus larger sizes to a satisfactory agricultural size.

The increase in labor rates, cost of mechanical supplies, and other features entering into the cost of production, coupled with increased cost of making the product more satisfactory in quality, naturally resulted in some increase in selling price; but such price increases were not commensurate with the increased quality.

It would be very natural to assume that the rapid increase in demand would tend to advance prices, but to offset this influence there has been a steady and rapid increase in the number of producing sources of supply. The increased production of the large, well-known, commercial quarries was far less than the increased tonnage being required by the farmers. New quarry operations were established at sites previously undeveloped. A few of these new operations were adjacent to railroads and became shipping as well as wagon and truck service quarries. Many more were of the road-side permanent type specializing in agricultural limestone, sometimes with road-building material as a sideline. Still other plants (and they have been numerous) have been of the small so-called "portable" type. These latter usually have been located at points where limestone deposits are exposed and are readily accessible; but in territory not closely adjacent to larger commercial operations. Frequently these portable outfits have remained in a locality only long enough to take care of the current demand, and then have moved to some other site to similarly serve that territory. All in all, large and small, Illinois has had in recent years a total of upwards of 200 producing sources of supply of agricultural limestone.

Aside from ground limestone, other

soil liming materials used in the Midwest, to more or less extent, are marl; industrial by-products; tufa; hydrated lime; air-slaked lime, etc.

As a rule (with the exception of hydrate) it is the relatively low cost of such materials, due to a nearby supply, that brings about their use. Other considerations being equal they are not so desirable, for they are apt to be low-grade, lumpy and contain excess moisture, and cannot be so evenly distributed in the soil.

Methods of Purchase and Sale

Originally most agricultural limestone was purchased by the farmer directly from a quarry or through a local dealer. A large part of the movement was by rail. The carload was unloaded by the farmer himself, or his hired help, and carted to his farm by horse-drawn vehicles. The material was spread upon the fields from the wagon, by hand, or with an end-gate spreader. The first mechanical spreaders were of this end-gate type; then came the sulkey or trailer type. Next came the power truck and with it the start of more direct transportation from quarry to farm, eliminating to that extent railroad shipments.

As time went on, more and more material was being handled in this direct way, until today a large part of the movement of agricultural limestone never sees a railroad car and is not touched by the farmer himself. The transporting trucker handles the whole matter from quarry to the farmer's field.

Usually farmers' elevators and lumber yards would not stock agricultural limestone but would act as a clearing house for orders and settlements. The farmer would order from the dealer who in turn would order from one of the quarries. The farmer would settle with the dealer; the dealer with the quarry. Today the so-called local dealer has almost entirely disappeared from the picture.

With the advent of the Farm Bureau movement, some attempt was made to clear orders through the County or State Farm Bureaus. In Illinois this practice assumed major proportions. The Illinois Agricultural Association worked out uniform contracts with any and all reputable companies which would coöperate therein. Under this contract quarry operators named their individual prices competitively, usually first conferring with the Illinois Agricultural Association's representative.

The quarry company also agreed to permit sampling by the Association's representative from time to time as there might be occasion. The Association in turn circularized the various County Farm Bureaus, reporting on the quality of the material produced by each company and the price each company was quoting currently. The deal being of a wholesale nature, a special discount from its list price was agreed to, by each company, in the case of all orders originated by or cleared through the County Farm Bureaus or the State Association.

This plan worked very nicely for a period of years. Under it a very rapid and satisfactory growth in the project was experienced. When the depression years came, however, it became necessary to abandon farmer coöperative purchasing.

Some of the other Midwest States also established some form of coöperative purchasing or ordering, but none developed the project to the same extent as Illinois.

Agricultural limestone does not lend itself readily to merchandising, in the usual sense of the word. Several of the states have developed very successful services in the coöperative purchasing field for such commodities as petroleum products, feeds, seeds, paints, tires and commercial fertilizers; but practically all of the commodities that have been handled successfully in a coöperative way are commodities that carry a relatively high unit price with a substantial margin of profit; thus they furnish opportunity for a considerable saving to the purchasing farmer, while at the same time they can carry the cost of organized purchasing and merchandising. Agricultural limestone, on the other hand, is a very low-priced commodity carrying very slight margin of profit, and so will not afford the costs of local storing for resale or of sales expense, to say nothing of profit. It would seem that the best service which the farmer's own organizations can continue to render is in the line of supervision of quality of material and satisfactoriness of service, and in the adjustment of complaints and claims. Every now and then some local organization or district group conceives the idea that coöperative bulk purchasing should effect a saving; but all such efforts, in the opinion of this author, are doomed to disappointment, if not to actual failure.

Federal Government Steps into the Picture

Eleven years ago at the annual convention of the National Crushed Stone Association in St. Louis, this author read a paper on agricultural limestone in which he dared to express the hope that sometime we might have a national governmental policy for the conservation of our most valuable national asset — soil fertility. The suggestion was ventured that farm acres treated with limestone and seeded to soil-building legumes might currently be relieved of taxes. This suggestion did not fully satisfy this author's idea as to what could be justified or might be necessary under an adequate national policy; but it was all that he dared to suggest and hope for at the time. Little did he or any of us realize at that time that in a period of less than ten years, we would have a National Soil Conservation policy and program which would step far beyond this humble suggestion.

Typical of spreading equipment used by farmers for distribution of agstone is the modern equipment purchased by Blue Rock, Inc.

The Federal Government was first brought into the picture through the insistence on the part of organized agriculture, that only through Congressional action could surplus crop production be prevented from completely ruining the farmer and, indirectly, the soil.

Finally the insistent pressure of the "Farm Block" began to bear fruit. Laws were passed and regulations established which rewarded the coöperating farmer, and penalized the non-coöperating farmer, in a program under which surplus crop production was controlled and limited by putting a definite portion of the acreage into soil-building crops coupled with the use of such soil-building commodities as agricultural limestone.

The program at first contemplated having the coöperating farmer purchase his own limestone and then receive, at the end of the contract year, a "compliance" payment from the Government based upon acreage and unit credits.

It was found that while the more progressive farmers could and did take advantage of this program, the farmers who were struggling with sub-marginal land could not find the money to make the initial investment even though they were to be later recompensed. In order to meet this situation, it became necessary to devise a plan under which the Government itself would finance the purchase of the limestone from the start, deducting the amount of money involved from the farmer's compliance check at the end of the contract year. This is the program now in operation.

In Illinois it had its start about three years ago. It was tried out in a limited way in the poorer agricultural districts of southern Illinois, and in some parts of other states. In 1941 it was extended to practically all of the territory.

This entering of the Federal Government into the project has been a major factor in bringing about some extensive and far-reaching changes which have greatly affected the producing quarries, the farmers and the intermediate men. Under this plan the farmer no longer buys direct from the producing quarry, nor does he order through his own Farm Bureau or his local dealer. Instead he makes requisition upon his local or county A. A. A. authority—the County Agricultural Conservation Committee.

The Government, at the start of the season, solicits bids from producing quarries on the "F. O. B. Quarry Truck" and "F. O. B. Rail" bases; and from transporting and spreading commercial truckers on "Delivered to the Farm" and "Spread Upon the Fields" bases. There is provision made also for the local dealer bidding on the basis of F. O. B. the local station, but this form of bid is used very little in the territory as a whole.

When the farmer makes an application to the Local Committee, the Committee determines the source of the material, or the delivering trucker, as the case may be, and a requisition is made upon this so-called "contractor," who in turn furnishes the material; bills the Government upon an established form when the job is finished; and receives his pay direct from the Government.

Very naturally this Government program has very greatly stimulated the movement and use of agricultural limestone, and has been a giant step forward in the establishment of good soil practices. Like all radical changes in this progressing world, this program, of necessity, has brought certain unfortunate effects with it. For one thing, it has tended to throw into the discard years of constructive and expensive effort upon the part of the individual quarry operator to build up a satisfied clientele of customers. Also in this same connection, it has taken away from the coöperating farmer, his right of choice as to source of supply and grade of material.

Another unfortunate accompaniment to the program grows out of the fact that it is not feasible, under the Administration's established rules governing bidding procedure, to recognize various degrees of quality with corresponding differences in price. Instead, it is necessary to establish a certain minimum specification, and all products and producers that are able to meet that minimum are on an even footing competitively.

In order that too many sources of supply may not be outlawed entirely, these minimum specifications cannot be placed too high. The result is that there is a wide range of grade in the "get-by" class material, and the high-grade careful producer does not receive the encouragement and reward to which he is entitled.

Still another feature, which has been, and is likely to continue to be, a source of trouble in the Government's program is involved in the transporting service. The commercial trucker has become a very vital and indispensable link in the agricultural limestone movement. Of necessity, commercial truckers constitute the major portion of the so-called bidders under the Government's purchasing program. Many of these truckers are men of high-grade business standards and are intelligent in making their bids, and endeavor to render satisfactory service. It is too much to hope, however, that all bidders will be of the responsible type. The fact is that many are incapable of intelligently estimating the basis for fair and workable bids, and frequently undertake contracts which they cannot possibly fulfill. Sometimes they over-estimate their tonnage ability; and sometimes they under-estimate the price at which they can continue to operate.

The Local Committees (much less the State contracting authorities) cannot be prophets and foresee, in many of these cases, the elements of failure. As a consequence, contracts are let which result in disappointment all around. Legitimate bidders and legitimate sources of supply are left without the business, and the farmer and his acres are left without the service.

It should be said that the Government authorities are as much aware of these difficult elements in the program as are any of the other interested parties, and are doing everything possible to overcome the weaknesses. All of this takes time.

(To be continued)

Fluorspar Establishes New Record

To MEET the unprecedented requirements of steel mills and aluminum plants, the fluorspar industry set new records of production and shipments, according to a Bureau of Mines report. Other large users include manufacturers of glass, enamel, and hydrofluoric acid. Shipments from mines in 1941, amounting to 320,669 short tons, were 37 percent greater than in 1940 and 22 percent more than the previous record (263,817 tons) made in 1918 of World War 1. Illinois and Kentucky were the largest producers, and furnished the bulk of the shipments.

Propose Fluxstone Rate

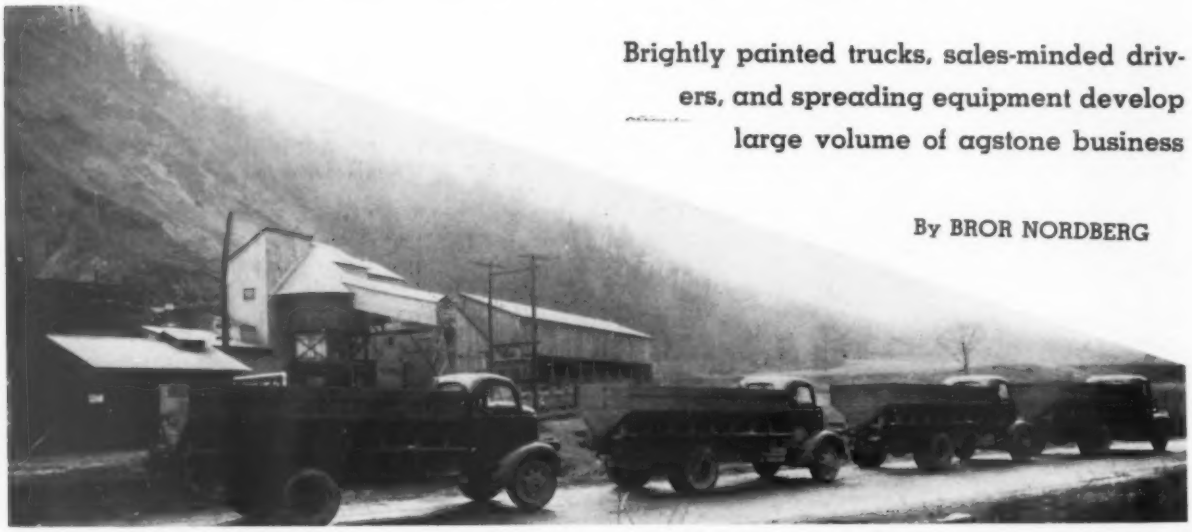
IT HAS BEEN PROPOSED by Examiner Alfred G. Hagerty in I. and S. No. 5050, Roasted Calcite, W. Va., and Ohio to Official Territory, that fluxstone rates be made 80 percent of the lime basis. The report also includes No. 28666, Ohio Calcium Co., Inc., vs. Baltimore & Ohio, et al. The examiner recommended dismissal of the formal complaint.

TRUCKING

Spreading Sells Agstone

Brightly painted trucks, sales-minded drivers, and spreading equipment develop large volume of agstone business

By BROR NORDBERG



Fleet of trucks equipped with agricultural limestone spreaders. Plant and quarry of Maymead Lime Co., may be seen in the background

IN THE NORTHEASTERN CORNER of Tennessee, near its border with North Carolina and Virginia, the Maymead Lime Co., of Shouns, Tenn., has developed an agricultural limestone business based entirely on farm delivery by trucks. It is said that this concern was the originator of farm delivery on government contract, back in 1936. Today, it is equipped to go a step farther and spread the limestone with its own equipment if the farmer wishes. This service is proving very effective in increasing sales.

Maymead Lime Co. is owned and operated by Maymead Farms, Inc., headed by W. B. Mount, president, and J. B. Mount, secretary-treasurer. Maymead Farms, Inc., operates a 2000-acre farm, on which the plant is located, and 1600 acres in North Carolina. The fact that the Mount brothers operated a farm as a successful business led to the start in the agricultural limestone business.

Their own requirements were for an annual application of 1700 tons of agricultural limestone, which they set out to produce in 1929. At that time they purchased the deposit now under excavation and a small plant that produced about eight tons per hour. Outsiders became interested in the product, with the result that the plant was rebuilt in 1936 and doubled again in 1940 until production reached a maximum of about 45 tons per hour. About 80 tons of limestone were sold in 1930, back in the days when limestone had to be given away and spread by hand at no expense to the farmer to convince him that liming his soil would increase his crop yields. In 1940, over 40,000 tons were sold and in 1941 about 75,000 tons.

All Deliveries by Truck

Floods washed out all rail facilities in 1940 and ever since the company has been trucking all deliveries into 12 counties for distances up to 180 miles round-trip. Shouns is in very mountainous country, a little over 2400 ft. elevation, and the trucks at times must climb mountain ranges close to 5000 ft. in elevation. Except for a few slack weeks in mid-summer, deliveries are made the year around with 24 trucks on the road and an extra 10 or 15 in peak times. Trucks are of several types, including trailers which haul 10 tons.

Product Has High Rating

Maymead Lime Co. has a rather unusual deposit of what might be called a disintegrated dolomite, that far exceeds the requirements for calcium carbonate equivalent set by either of the three States in which it operates. It averages about 43 percent $MgCO_3$ and 55 percent $CaCO_3$ which, combined, give a calcium carbonate equivalent of about 106. Requirements are for 80 or 85 percent, which enables the company to guarantee 98 percent and then pleasantly surprise the farmer by showing him tests proving that he is getting more than the original liberal guarantee.

By grinding through hammer mills closed-circuited with vibrating screens, the plant is well-equipped to meet the gradation requirements of 100 percent minus 10-mesh and about 55 percent through 100-mesh. Grinding is accomplished by two Brooks Equipment Co. No. 70 Day pulverizers each closed-circuited with two vibrating screens—one with Universal and Allis-Chalmers screens, the other with two Allis-Chalmers screens. Fines are first scalped out ahead of the mills by Allis-Chalmers screens. Finished product is weighed out in a 1-ton Blaw-Knox batcher from a 215-ton steel bin into which agricultural limestone from undercover reserve storage can be conveyed by belt conveyor. The company guarantees a maximum moisture content of five percent. In dry weather it runs as low as 1½ percent; in wet weather dried material might be weighed out from the reserve storage, or a blend made in the bin from fresh product and that reclaimed from storage. Moisture determinations are actually made, in order to

All deliveries are made by a fleet of trucks which are kept brightly painted and clean as a sales stimulant

insure against exceeding the five percent guarantee.

A small sample of each ton batch is taken, and daily chemical analyses made from a composite sample at the Tennessee State Teachers College in Johnson City, Tenn. Similarly, samples are taken for a weekly sieve analysis and the test results are used to advantage in selling limestone. Other sales tools, in the product itself, in addition to low moisture content, chemical analysis and gradation control are the softness of the product and a proven early reactivity with the soil.

Bids on Grant-of-Aid Contracts

About 90 percent of the 1941 sales were attributable to the Agricultural Adjustment Administration program. The company bids on Grant-of-Aid contracts in the several counties which it serves. The procedure is simple. Qualified farmers go to their local county agents and make known their wants in terms of a certain amount of limestone and phosphates. He specifies the amount of each he wants, totalling up to his dollar allotment. All of the agricultural limestone amounts for a given county are cleared through the AAA State office and sent out as a list to the producer who is low bidder. This producer bids in a set price for agricultural limestone *delivered* on these farms. When deliveries to all the farms are completed, the contract is sent to Washington and payment to the producer follows in about 30 days.

However, the farmer is not under obligation to get his limestone from the company holding the contract, nor is he required to take a definite proportion out of his allotment, or any part of it, in phosphates. He can get delivery from another approved source, or truck it himself or make other arrangements for delivery. Thus, the Maymead Lime Co. is afforded an opportunity to sell the merits of its product against competitive products, or phosphates, and through its services to the farmer.

Maymead Lime Co., Trucker's Report for _____ Truck No. _____

Speedometer Reading Night - _____
Speedometer Reading Morning - _____
Miles Driven During Day - - _____

Gallons of Gasoline Put in Truck - - _____
Quarts of Oil Added - - - - - _____
Oil Changed (Speedometer Reading) _____
Grease Job (Speedometer Reading) - _____

Tons of Lime Hauled to _____ County _____ Spread _____
Tons of Lime Hauled to _____ County _____ Spread _____
Tons of Lime Hauled to _____ County _____ Spread _____
Tons of Lime Hauled to _____ County _____ Spread _____
Tons of Lime Hauled to _____ County _____ Spread _____
Any Other Trips or Hauling Beside Lime Hauling _____

Where Repaired _____
Repairs to Truck _____
Cost of Repair Job _____
Tires Replaced on Truck: Size of Tire, Speedometer Reading, Which Tire, Etc. _____
Miles Tire Taken Off Had Run _____ Did Tire Blow Out _____ Wear Out _____ Cut _____
Hours Worked by Driver _____
Remarks: _____ Driver _____

Truck record sheet which drivers are required to fill out. Information gives a complete check on operation

Buy New Trucks and Spreaders

Truck drivers are considered the company's best salesmen. Until October, 1941, all trucks were hired. In anticipation of difficulties in getting truckers, the company purchased five new Chevrolet trucks and equipped them with Baughman self-unloading spreaders to better serve

(Continued on page 40)

SPREADING

Distributing Plant Sells Agstone

Blue Rock, Inc., operates auxiliary plant to distribute agstone in three distant counties

Plant view showing steel bins, hammer mills in foreground, quarry conveyor to the left, above; and below, conveyor carrying recrushed stone to overhead steel bins

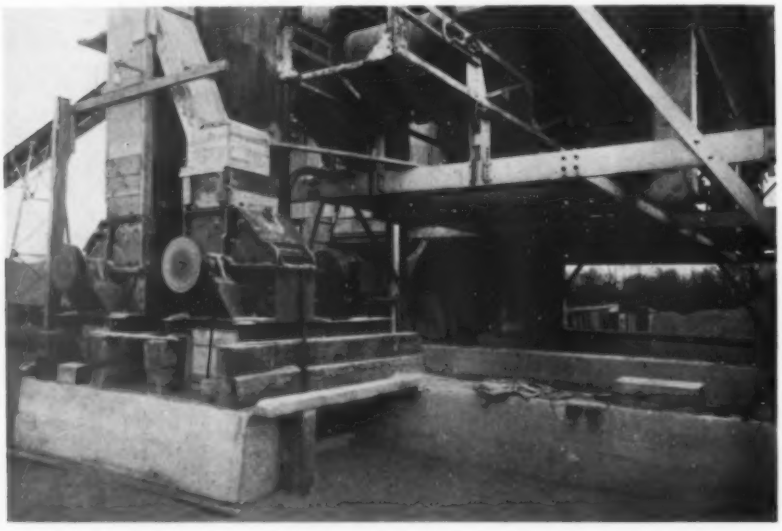
In Ohio, A.A.A. Grant-of-Aid contracts for agricultural limestone are bid in by stone producers in three ways. Blue Rock, Inc., of Greenfield, Ohio, for example, submits bids f.o.b. quarry, for farm yard delivery, and for limestone delivered and spread. The farmer has his choice.

It would be preferable for farmers to have their own limestone spreading facilities to permit the purchase of more limestone with that part of each allotment spent for putting it on the soil. In the absence of such facilities, Blue Rock, Inc., has equipped itself to serve the farmer by purchasing spreading equipment which will operate in the seven counties which it serves. Five spreading units were purchased, each consisting of a John Deere manure spreader on pneumatic tires pulled by a Ford tractor on rubber tires.

Agricultural limestone is delivered on to the farmer's property with the understanding that it will be spread later—usually when the fields are in tractable condition. Drivers of the spreaders can then make a systematic tour of the farms to spread the stone, leaving the unit at the nearest farm at nightfall, to resume in the morning. Drivers are former plant men. Spreading is charged for at 50c a ton, and each machine will handle 60 tons per average day. These spreaders travel the highways at the rate of 15 to 18 miles an hour.

Availability of this equipment has helped to increase sales of agricultural limestone, and spreading, in itself, is profitable. Farmers are said to appreciate the fact that these tractor machines will not mire down in the soil where they might damage drain tile. Neither does the company desire to drive trucks in the fields. Each machine will be painted the orange color that is standard for all the company's mobile equipment. Company-owned and contracted trucks make the farm yard deliveries. The drivers are the principal salesmen. A company salesman travelled the farms regularly in 1941.

Four counties are served out of the plant bins and three from a distributing plant at South Charleston, near Springfield, Ohio, which was opened in 1941 for the distribution of all grades of stone. Agricultural stone is shipped 40 miles by rail in gondola cars to South Charleston where it is stockpiled by a gasoline crane along with other grades of stone. It is reloaded into trucks by a Barber-Greene loader. The South Charleston plant has a manager and was established to render better service to that territory.



Close-up of hammer mills producing agstone. Stone from plant bin is carried by belt conveyor to overhead chute into mills. Product is elevated into another bin. Belt conveyor to the right is for carloading commercial stone

Plant Equipment to Make Agstone

When Blue Rock, Inc., built its plant in 1938, agricultural limestone was the product of screening fines through a No. 8 wire screen on one of its vibrating screens. Production was about 10 tons per hour and still is from that source. The bin system built at that time, and facilities to withdraw stone from any bin for recrushing through two 2-ft. 8-in. Traylor gyratory crushers (see Rock Products, August, 1938, p. 51) and return to the screens over the bins

AIR SEPARATORS
Wartime AGRICULTURE DEMANDS Quick Results
Finer ground lime-stone, lime or hydrate gives best results for this year's crops....
RING ROLL MILLS

STURTEVANT offers you proven-efficient pulverizing and fine air separation equipment, precisely adapted to producing the finer ground limestone, lime and hydrate needed by farmers for quickly increasing the productivity of their soil this year.

Over a period of many years, in plants throughout the world, **Sturtevant Ring Roll Mills and Air Separators** have proven themselves by increasing output with their large capacity and dependable operation. They are the ideal combination in a closed circuit system for producing finely ground materials.

Sturtevant Ring Roll Mills provide a range of reduction from 10 to 200 mesh, equally efficient on hard or soft materials.

Sturtevant Air Separators include such engineering features as (1) Range of fineness from 40 to 350 mesh, (2) Capacities of 1/4 ton to 50 t.p.h., while increasing mill capacity as much as 300%, (3) Controlled specific surface area, (4) Lowered mill and product temperatures.

Investigate today how Sturtevant grinding and separation equipment can help you meet strict specifications for finer ground materials. Write us.

- **Air Separators**
- **Crushing Rolls**
- **Ring Roll Mills**
- **Swing Sledge Mills**
- **Jaw Crushers**
- **Moto-Vibro Screens**
- **Rotary Fine Crushers**

STURTEVANT MILL CO.
Harrison Square
BOSTON MASS.

STURTEVANT

Tractor and spreader combination which has helped to increase agricultural limestone sales for Blue Rock, Inc., Greenfield, Ohio

make it possible to pulverize agricultural limestone 24 hr. a day.

Stone can be withdrawn from any bin to the crushers and transferred by belt conveyor back to the main belt conveyor feeding to the plant from the primary crusher in the quarry. The present pulverizing arrangement consists of two size BX type H. M. Williams hammer mills, each driven through a direct-connected 50-hp. electric motor, which are fed stone from one of the overhead bins by belt conveyor. Discharge from the pulverizers is elevated into another bin as finished product for direct loading into trucks. Ordinarily the feed is a minus ¼- or ½-in. product taken direct from a 120-ton steel bin but sometimes a feed size up to 1½-in. is fed into the mills. Larger stone from two other 120-ton bins can be withdrawn into the reduction crushers preparatory to becoming pulverized feed, for continuous operation. Each mill produces 12 tons an hour.

Specifications in Ohio require that 90 percent pass an 8-mesh sieve, 50 percent a 50-mesh and 20-mesh the 100. Calcium carbonate equivalent must be at least 80 percent and moisture content must not exceed eight percent.

Spreading Sells Agstone

(Continued from page 37)

the farmers. Special truck bodies afforded an opportunity for attractive advertising. They were painted a brilliant orange with the company's name printed on both sides and back.

These trucks, which haul 7 to 8 tons to a load, have done much to increase the volume of sales, because they are a continuous advertisement, have equipment to spread the limestone, and the drivers are company-trained. Most of the hired truckers are not equipped to spread the limestone.

Drivers Trained for the Job

The company drivers are required to pass State Highway examinations and have been educated to the company's business by having previously worked in the plant. Each man is required to keep his truck clean and must have it regularly inspected by mechanics and greased. Until recent shortages in materials came about, each driver wore uniforms specified by the company. He must abide by traffic regulations, and is instructed to put the limestone wherever the farmer wants it, if possible.

A daily work sheet is filled out by each driver giving a complete record of his accomplishments, including the tons of limestone delivered and the tonnage spread. Each driver is expected to show an income from his truck of $18 for a day, which includes the truck delivery charge and the income for spreading. Spreading is charged for at the rate of 30c per ton and must be collected by the driver, since it is not provided for in Grant-of-Aid contracts. Delivery charges run as high as $1.75 per ton.

Separate trucking and spreading accounts are kept in the company records. Prizes up to $20 are paid out to the drivers showing the greatest income for their trucks for a 12-month period. Whenever possible, the new trucks are dispatched as a fleet into the far counties to create an impression. Company officials say that the spreading equipment has sharply increased sales. When the driver makes delivery and sees that the farmer's fields are in shape for spreading, he asks the farmer if he wants the limestone spread and the answer is usually favorable. If the farmer sees that the limestone is insufficient, the driver tells him that he can bring another load out on his next trip. In addition, the drivers get the names of neighboring farmers who do not operate under the AAA and their names are added to the company's file card system. Farmers have taken to the convenience of having the limestone spread for them to the extent that the cost of the spreading truck-beds was written off in 4½ months.

Selling Methods

W. B. Mount is in charge of operations at both the plant and the farm and J. B. Mount handles the sales for both. About 75 percent of his time is spent on the road, calling on farmer prospects and checking on the service rendered by the truckers. County agents are called on with regularity every two weeks, which gives him an opportunity to straighten out any mistakes in delivery, since the truckers are paid 30 days after delivery is made. He is present at all the county AAA meetings and makes a visit once or twice a year to each State office. At county meetings he frequently is called upon to discuss soil-building practices and distributes his promotional literature. In talking to the farmers, either at the meetings or on the farms, an opportunity is given to play up the merits of his product. It must be remembered that, on contracts with Grant-of-Aid, the low bidder gets the contract, even though another bidder might have a premium product. Mr. Mount works with the AAA in inducing farmers to come under its provisions.

About six weeks before the annual AAA program closes, Mr. Mount sends out letters to all the farmers on his list calling the deadline to their attention and, invariably, the letter brings results. Another letter is sent out when the new program starts, urging the farmers to come early and avoid the rush. Many of the large, wealthy farmers, who do not come under the AAA, buy on a cash basis when they see how conveniently the limestone can be placed right on their fields.

Mechanical pencils, with an appropriate advertisement on them, are given to everyone connected with the limestone section of the AAA offices.

SO SIMPLE IT'S UNBELIEVABLE...

Here's how TAMPTITE increases output...

Just put a Tamptite cartridge of Hercules dynamite in the bore hole. Then tamp in the usual way.

Presto, the charge is compacted *inside the wrapper*, concentrated to get better breakage.

No slitting of cartridges =
Time saved in preparation.

No messy spilling of powder =
Time saved in loading.

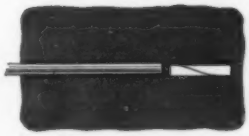
No air space around dynamite =
Time saved in handling blasted material because of better breakage.

Any way you add it up, Tamptite saves time. And *time saved* means *increased output* in any language. Ask Hercules for Tamptite cartridges on your next dynamite order.

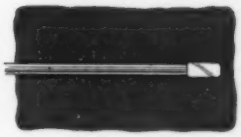
•

HERCULES POWDER COMPANY
INCORPORATED
946 KING STREET • WILMINGTON • DELAWARE

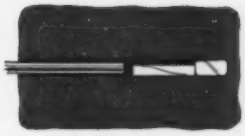
A QUICK LOOK AT TAMPTITE IN ACTION!



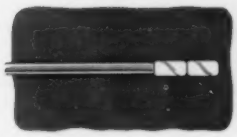
The regular-size cartridge goes in the bore hole. Note the space to be filled.



Pressure from the tamping rod compresses the powder to fill the space.



Another cartridge goes in—Compaction takes place inside the wrapper.



The charge is concentrated for better blasting results.

A-84

Making Limestone Dust

Agstone and two dust products are manufactured by Consumers Company

By RALPH S. TORGERSON

MOST PLANTS want to get rid of dust, but the Bellwood, Ill., plant of Consumers Company, Chicago, has special facilities for making dust. The various steps in the process, however, are totally enclosed so that very little dust is present in the atmosphere.

The original product from which limestone dust is made is the screenings, having a top size of about ⅜-in. Screenings are elevated to the dust plant from the bins by means of an enclosed 18-in. belt conveyor, 80 ft. centers. This conveyor discharges by means of a by-pass chute directly into the dryer or to a bucket elevator to the top of the plant. From the elevator, the material goes into a hopper feeding a short 12-in. screw conveyor. The screw conveyor serves to provide a uniform feed to a 42- x 96-in. Universal Vibrating screen with 3/16-in. mesh cloth. Immediately in front of the end of the screw conveyor are a series of vertical pipes in which rods are free to move. Material from the screw passes down between the rods and is spread evenly across the screen. This screen scalps out the chips from the screenings, the throughs going into the agricultural limestone bin. As a further means of providing exceptionally clean, dust free chips, the oversize from the first screen is split into two streams feeding two 3- x 8-ft. Universal Vibrating screens placed at right angles to the 42- x 96-in. screen. While the first screen could probably handle the feed satisfactorily, the two smaller screens were available from another plant and have proved to be excellent insurance in screening damp material. All three screens have 3/16-in sq. openings.

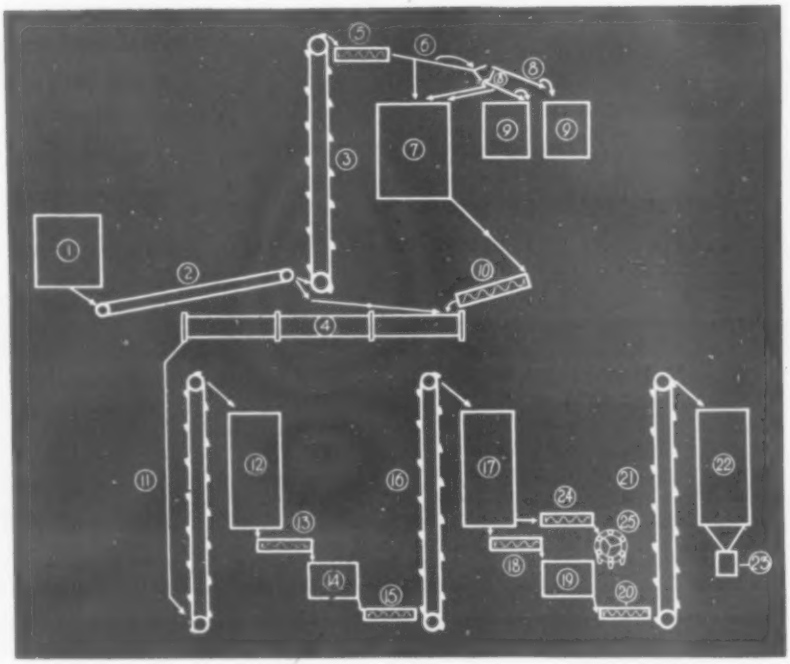
At the bottom of the agstone bin, which has a capacity of 420 tons, is a trough in which another screw conveyor is located to take material into the dryer. As a general rule, the feed into the dryer is minus 3/16-in. from the agstone bin but as previously mentioned, the screenings may be by-passed from the 80 ft. centers plant conveyor into a chute feeding the dryer.

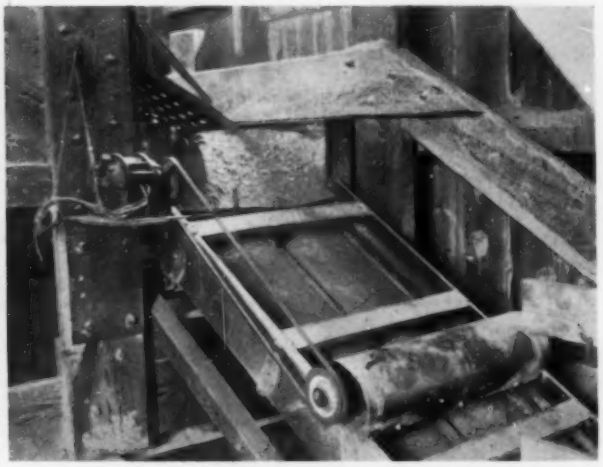
In winter when the quarry is not operating, screenings may be taken from stock piles by means of a long conveyor supported by special scaffolding to a chute feeding another screw conveyor which transfers material to a screw conveyor under the agstone bin.

Drying and Fine Grinding

The dryer, which is 75 ft. long, has a capacity of 20 tons an hour. Dried material is chuted into the boot of a bucket elevator which goes to the top of the first of three concrete silos 50 ft. high and 20 ft. in diameter, each of which holds about 200 tons each. A screw conveyor

Flow sheet of operations at Consumers Co., Bellwood, Ill., agricultural limestone and dust plant. 1—Screenings bins. 2—18-in. belt conveyor, 80-ft. centers. 3—Screenings go to top of plant by bucket elevator or may be by-passed direct to rotary dryer. 4—Rotary dryer. 5—Short 12-in. screw conveyor provides uniform feed to 42- x 96-in. vibrating screen to scalp out chips, throughs going to agricultural limestone bin. 8—Oversize chips pass to two smaller vibrating screens for further cleaning. 9—Bins for stone chips. 10—Screw conveyor from agricultural limestone bin is the main source of material for 75-ft. rotary dryer. 11—Dried agstone elevated to 200-ton concrete silo (12). 13—Screw conveyor to 6- x 6-ft. ball mill. 14—Product of first ball mill goes by screw conveyor (15) and bucket elevator (16) to No. 2 dust bin (17) containing minus 40-mesh material which may be hand packed in sacks by withdrawal in screw conveyor (24) to hand packer (25). 18—For a finer product, the minus 40-mesh is withdrawn from the No. 2 dust bin by screw conveyor (18) to another 6- x 6-ft. ball mill (19) where it is ground to 85 percent through 200-mesh. 20—The fine dust is carried by screw conveyor (20) and bucket elevator (21) to bin (22) from which it is sacked out (23) for sale as asphalt filler and other uses





Left: Feed end of 42- x 96-in. vibrating screen producing agstone from screenings. Note arrangement to spread feed from screw conveyor. Right: One of the two vibrating screens, which are at right angles to large screen, remove all dust from stone chips

feeds the dried material from the silo into a 6- x 6-ft. Allis-Chalmers ball mill which grinds the 3/16-in. top size agstone or screenings to 40-mesh at the rate of 25 tons an hour. If screenings are used the grinding capacity is cut down. The 6- x 6-ft. ball mill product is conveyed by a short 12-in. screw conveyor to the boot of a second elevator leading to the top of the second silo. To make a finer product, the 40-mesh material is withdrawn from the second silo to the 5- x 15-ft. Allis Chalmers mill which grinds from 75 to 85 percent through 200-mesh at 25 tons an hour. Another screw conveyor carries the product of the second ball mill to the elevator serving the third silo.

A Bates bagging machine receives its feed from the third silo. No. 1 dust, as it is called, is 75 to 85 percent through 200-mesh, and is used as a coal mine dusting material, asphalt filler, and for various industrial applications. The 40-mesh or No. 2 dust in the second storage silo is withdrawn by an 8-in. screw conveyor to a packing bin with a slide gate for hand packing. Bags are suspended from rings, to hold the ends open which are fixed to a revolving circular steel frame so that as each bag is filled another bag can be brought into position under the slide gate spout for filling.

Agstone Specifications

Agricultural limestone at Bellwood plant has an analysis of:

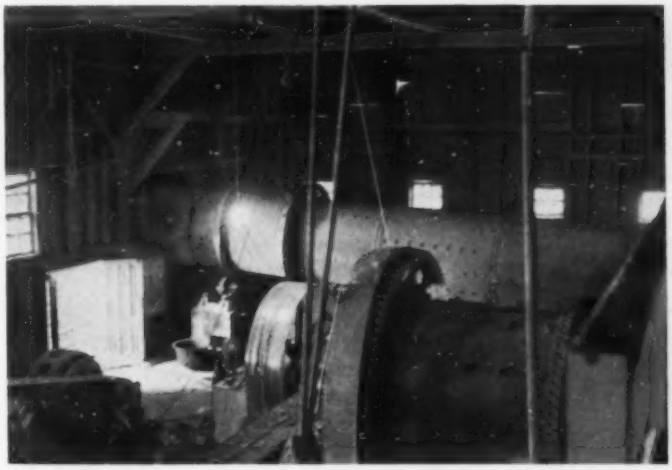
	Passing
No. 4 mesh	83%
No. 8 mesh	60%
No. 16 mesh	43%
No. 50 mesh	19%
No. 100 mesh	13%

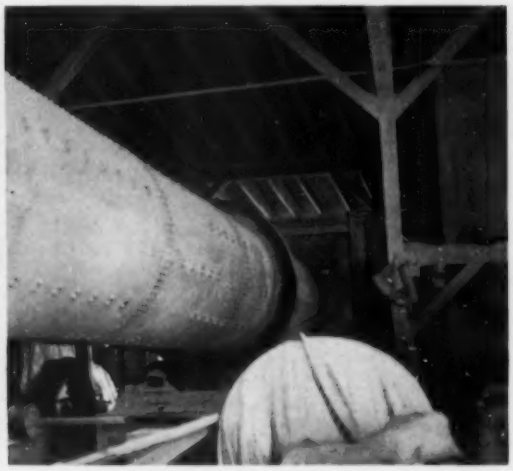
No. 1 Dust is about 85 percent through 200-mesh and 100 percent through 100-mesh No. 2 dust has the following analysis:

	Passing
No. 4 mesh	100%
No. 8 mesh	92%
No. 16 mesh	79%
No. 50 mesh	48%
No. 100 mesh	37%
No. 200 mesh	31%

All elevators and screws are Stephens-Adamson type.

The McCook plant of Consumers Co. uses the same general plan of scalping off chips from screenings to obtain agstone.





Left: Long rotary dryer in the background and in the foreground one of the two ball mills for fine grinding. Right: Looking toward firing end of rotary dryer for drying screenings

SELLING

Shooting At 28 Million Ton Market

Selling and distribution problems of agricultural liming material in Ohio

By W. H. MARGRAF*

THE AGRICULTURAL BUSINESS of the limestone industry has undergone a noticeable change since the days of the missionary or educational work up to the present time. In the early days if the manufacturers could sell 200,000 tons among them in the State of Ohio, they felt satisfied with this tonnage. Sales of this amount of ground limestone and screenings meant many days of personal contact with the farmers. Many demonstrations were made and much time was spent in overcoming an unexplained prejudice of the farmer to using ground stone. Many samples of soil taken from the fields were analyzed for acidity and often when soil showed a strong reaction farmers hesitated to apply limestone or lime carbonate, a proven and recognized corrector of acid soil.

U. S. Soil Conservation

Today many farmers personally take samples of soil from their various fields and mail the samples to the Agronomy Department of their State College and if lime is recommended, order through their local dealers. Throughout the years farmers have learned the value and benefits of liming through the work of agronomists and field men of State Colleges. Farm papers have carried numerous articles showing the results obtained by liming acid soils. Farm Institute speakers have devoted entire meetings to the use of lime and the worth while results secured. Cropping and leaching throughout the years has depleted the soil of lime, so that the farmers of today know that eight acres out of ten require and respond to a lime treatment.

The Limestone Association, which has been functioning for about a quarter of a century, has contributed valuable information to its members and has sponsored many worth while projects, and through its efforts has been the means of increased sales for its members, and the farmer has benefitted in increased production and has improved his soil by the use of liming material which is now considered a farm necessity.

In the past six years manufacturers and dealers had to be equipped to haul and spread liming material from quarries or railroad sidings. The demand is rapidly increasing for this complete type of service. Due to priorities and scarcity of farm labor this type of service may be somewhat curtailed, which will have a direct bearing on next year's movement of liming material.

The Soils Conservation Program for Ohio started in 1939 and is responsible for over a quarter of a million tons. In 1940 the tonnage moved on this program amounted to 641,000 tons. In 1941 over a million tons were credited to the Soils Conservation Program of the A.A.A., however, total tonnage for the State of Ohio was considerably higher for these three years. We attribute this to several causes—farmers were becoming lime conscious; their incomes were increasing; the diligent efforts of the manufacturers; the agricultural association and the Government's Grant-of-Aid Program.

What the Future Holds

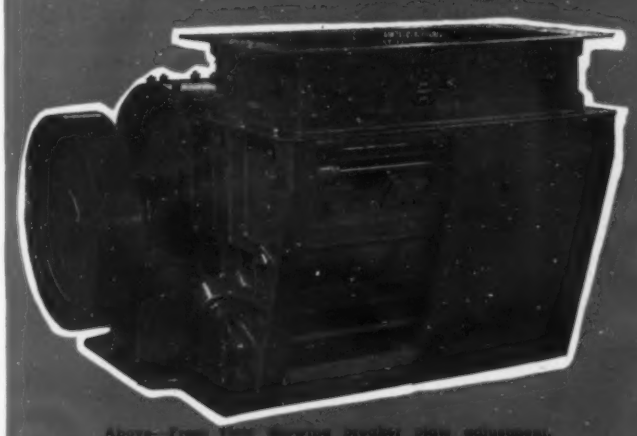
Despite the splendid tonnage mentioned, there appear to be flaws in the present program. Particularly in the screen requirements and minimum neutralizing power required by the Soils Conservation Program. According to a number of Ohio manufacturers the 1942 Program still lacks a high enough screen requirement of the 100-mesh material, and the total neutralizing power in terms of calcium carbonate is entirely too low for a quick acting, quality product. Efforts are now being made by the Association to interest the State Committee in adopting a finer product in addition to the product they have approved.

In the early years only half of the soil in the State of Ohio required lime, but today through cropping and leaching the entire state requires lime. While the application of lime has been on the increase during recent years, the total to date is still far short of the amount that could be used profitably. It is estimated that Ohio farmers will apply well over one million tons of liming material again in 1942. How far short this is of the total amount needed is indicated by the estimate that it would take 28 million tons applied this year to cropland and pastures to put all the land in condition to grow alfalfa and clover, and yearly applications of two million tons to maintain this condition. Surely more than enough business for all of the older companies and the numerous new producers that started in business due to the A.A.A. program.

Farmers throughout the country made $11,706,000,000 in 1941—34 percent above average. Ohio farmers through their diversified farming received their portion of this increase. With the recent demand of the United States Department of Agriculture for war foods, this means a heavy demand for proteins — dairy products, meats, poultry products and oil producing crops. Lime is the keynote of successful legume production and the foundation around which can be built more efficient crop production and better feed for the livestock farmer.

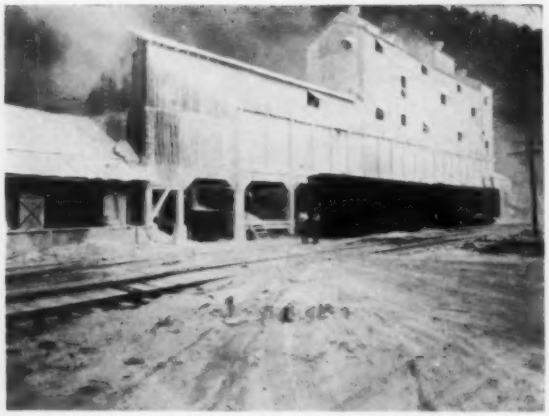
Back of efficient protein production is a plentiful supply of legumes. The Government Grant of Aid Program will continue and the farmer will be asked to maintain it. America will be called upon to feed the world until the farmers in the war-ridden countries can again get their land to bear crops. As to the length of the war and reconstruction period, no one at this time seems to know, but I feel certain that the coming years will continue to call for a large tonnage of agricultural liming material.

* Secretary of the (Ohio) Limestone Association.



Above—Front view showing breaker plate adjustment.

Below—One of two 30- x 40-in. American pulverizers used by Willingham-Little Stone Co.



View of Willingham-Little Stone Co., Whitestone, Ga. One of the state's largest producers of agricultural limestone.

Proof That the AMERICAN WAY is The Economical Way To Produce AGRICULTURAL LIMESTONE

To help fill the big demand for agricultural limestone at the plant of the Willingham-Little Stone Co., Whitestone, Georgia, this large producer uses two economical and dependable American Hammer Mills.

These ruggedly built Crushers, long known for their low cost, are capable of turning out top tonnages of specified fineness.

SIMPLICITY—in design and operation —assures continuity of service.

STURDINESS — in construction — extra heavy construction, built to withstand the most severe service.

EXCEPTIONAL—operating characteristics—anti-friction bearings, Patented adjustable Grinding Plate, metal trap, manganese grinding parts and the original American Hammer design.

Let us show you how an AMERICAN Crusher will help you to produce agricultural limestone economically and dependably.

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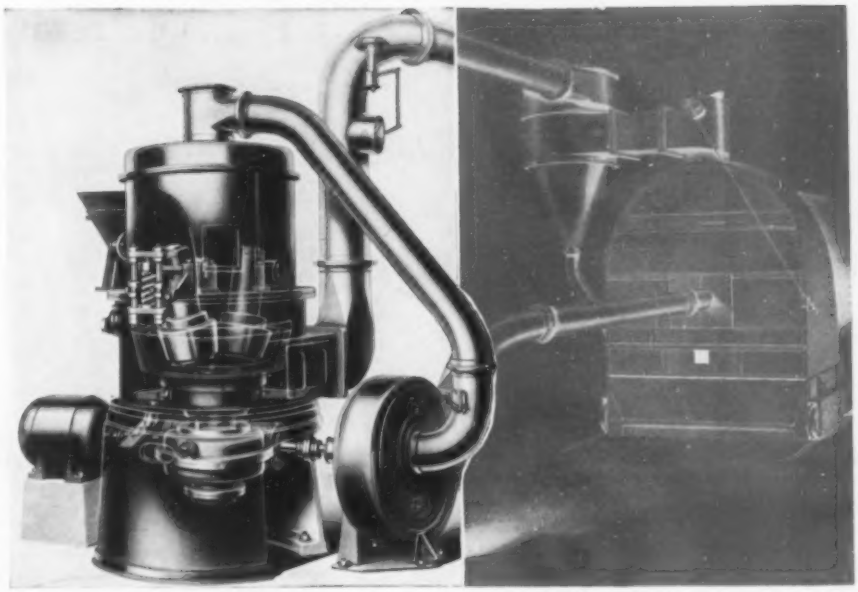
BOWL MILL FIRING

INSURES *New* KILN ECONOMIES

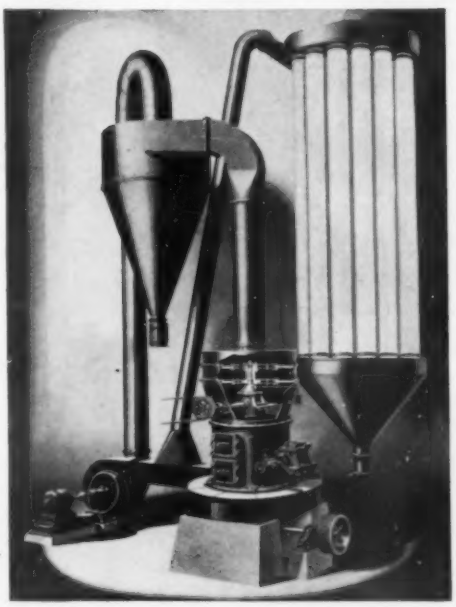
- The accepted *direct firing unit* of the lime and cement industries for use on rotary kilns.
- Handles any grade of coal.
- Increases kiln production.
- Maximum lime-fuel ratio.
- Maintains uniform grind.
- Wide flexibility of control.
- Savings in power costs.
- No separate dryers needed.
- Noiseless, dustless operation.
- Capable of continuous running, months at a time, without shut-downs.



RAYMOND

MODERN LIME PRODUCTION METHODS

Whizzer-Equipped ROLLER MILLS for High Tonnages and Low Costs in pulverizing Agstone, Dolomite, Quicklime and Limestone Fillers.



This latest type of Raymond ROLLER MILL has the double whizzer separator with a wide range fineness control from 60% minus 100-mesh to 99.99% passing 325-mesh, instantly adjustable while mill is operating. Ideal for making different grades of quicklime, fillers and fertilizers. Ask for Catalog No. 51.

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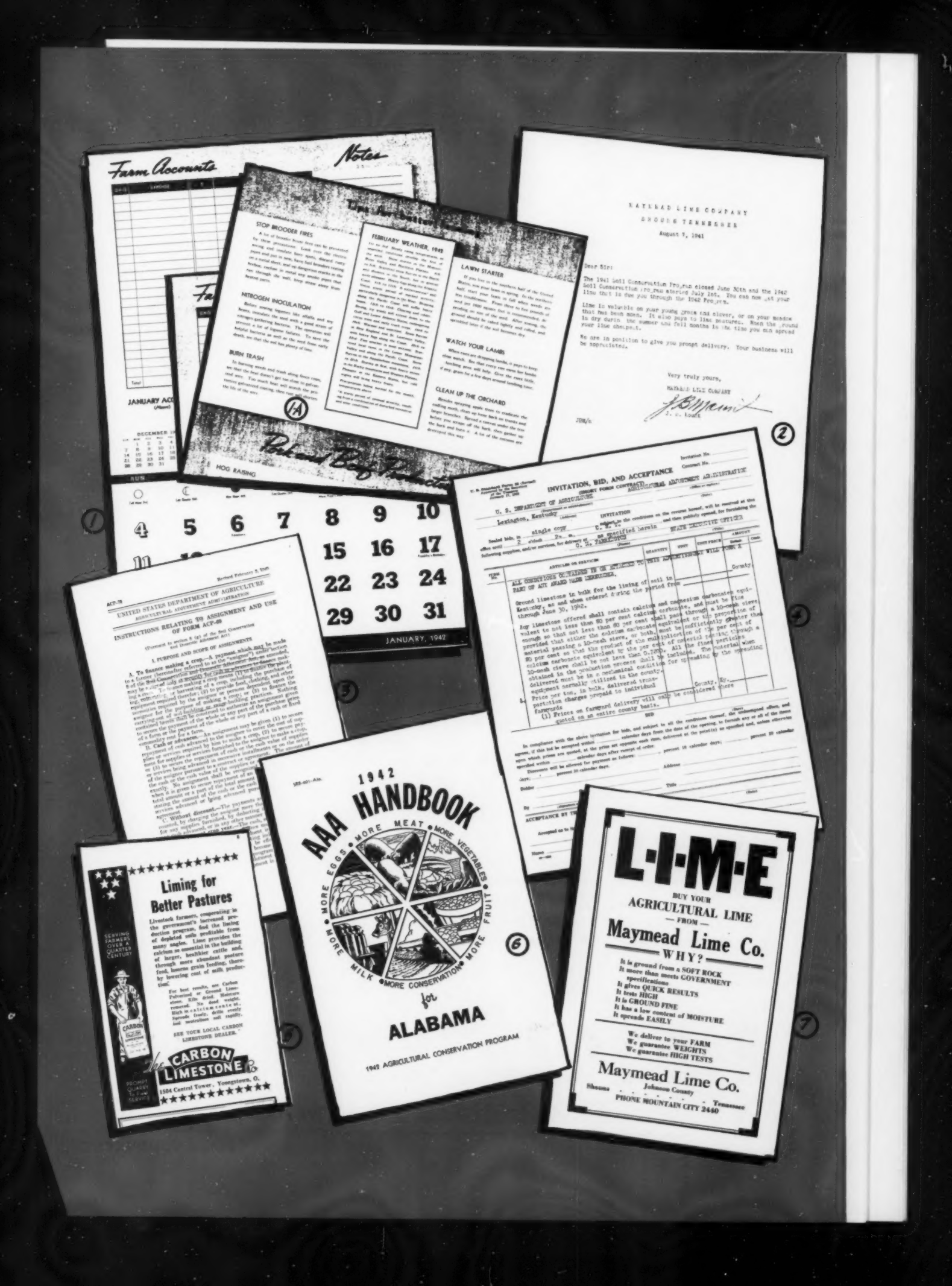
Farm Accounts
Notes
JANUARY ACC
DECEMBER
STOP BROODER FIRES
NITROGEN INOCULATION
BURN TRASH
FEBRUARY WEATHER, 1942
LAWN STARTER
WATCH YOUR LAMBS
CLEAN UP THE ORCHARD
HOG RAISING
MAYMEAD LIME COMPANY
August 7, 1941
Dear Sir:
Very truly yours,
MAYMEAD LIME COMPANY
INVITATION, BID, AND ACCEPTANCE
U. S. DEPARTMENT OF AGRICULTURE
Lexington, Kentucky
single copy
ALL CONDITIONS OBTAINING IN OR APPLICABLE TO THIS APPLICATION WILL FORM A PART OF ANY AWARD MADE HEREUNDER.
Ground limestone in bulk for the liming of soil in Kentucky, as and when ordered during the period from through June 30, 1942.
Any limestone offered shall contain calcium and magnesium carbonates equivalent to not less than 80 per cent calcium carbonate, and must be fine enough so that not less than 80 per cent shall pass through a 10-mesh sieve, provided that either the calcium carbonate equivalent or the proportion of material passing a 10-mesh sieve, or both, must be sufficiently greater than 80 per cent so that the product of the multiplication of the per cent of calcium carbonate equivalent by the per cent of material passing a 10-mesh sieve shall be not less than 0.7600. All determinations of fineness obtained in the production process shall be included. The material when delivered must be in a mechanical condition suitable for spreading by the spreading equipment normally utilized in the county.
Price per ton, in bulk, delivered transportation charges prepaid to individual farmers
(1) Prices on farmyard delivery will only be considered where quoted on an entire county basis.
ACCEPTANCE BY THE
Revised February 5, 1940
ACP-78
UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL ADJUSTMENT ADMINISTRATION
INSTRUCTIONS RELATING TO ASSIGNMENT AND USE OF FORM ACP-69
I. PURPOSE AND SCOPE OF ASSIGNMENTS
A. To finance making a crop.—A payment which may be made to a farmer (hereinafter referred to as the "producer") under section 8 of the Soil Conservation and Domestic Allotment Act (16 U.S.C. [illegible]) may be assigned by the producer to any person (1) to finance the making of a crop, including the purchase of fertilizer required therefor; (2) to provide food, clothing, and other assistance required by the producer or persons dependent upon the producer for the purpose of making a crop; or (3) to finance the carrying out of soil-building or soil-conserving practices. Nothing contained herein shall be construed to authorize an assignment given for the purpose of the making of a crop, or any part of the purchase price of a farm or the payment of the whole or any part of a cash or fixed commodity rent for a farm.
B. Cash or advances.—An assignment may be given (1) to secure payment of cash advanced by him to the producer to enable the producer to purchase or secure by barter fertilizer required by him to make a crop, or (2) to secure payment of services rendered by him to the producer to enable the producer to purchase or secure by barter fertilizer required by him to make a crop, or (3) to secure payment of cash or the cash value of supplies furnished by him to the producer to enable the producer to purchase or secure by barter fertilizer required by him to make a crop, or (4) to secure payment of services being rendered by him to the producer to enable the producer to purchase or secure by barter fertilizer required by him to make a crop, or (5) to secure payment of the cash value of the services rendered by him to the producer to enable the producer to purchase or secure by barter fertilizer required by him to make a crop. The amount of the assignment shall be limited to the cash value of the supplies or services furnished or to be furnished or rendered by the assignee to the producer to enable the producer to make a crop, and shall be stated exactly. No assignment shall be given to secure repayment of cash advanced when it is given to secure repayment of cash advanced in connection with the purchase of any supplies or services, unless the total amount of the assignment shall be limited to the cash value of the supplies or services furnished or to be furnished or rendered by the assignee to the producer to enable the producer to make a crop, and shall be stated exactly. No assignment shall be given to secure repayment of cash advanced when it is given to secure repayment of cash advanced in connection with the purchase of any supplies or services, unless the total amount of the assignment shall be limited to the cash value of the supplies or services furnished or to be furnished or rendered by the assignee to the producer to enable the producer to make a crop, and shall be stated exactly. No assignment shall be given to secure repayment of cash advanced when it is given to secure repayment of cash advanced in connection with the purchase of any supplies or services, unless the total amount of the assignment shall be limited to the cash value of the supplies or services furnished or to be furnished or rendered by the assignee to the producer to enable the producer to make a crop, and shall be stated exactly.
C. Without discount.—The payments assigned shall be computed by charging the assignee more than the cash price for any supplies furnished, by deducting a discount from the cash price for any supplies furnished, or by any other method.
1942
AAA HANDBOOK
MORE EGGS
MORE MEAT
MORE VEGETABLES
MORE MILK
MORE CONSERVATION
MORE FRUIT
for
ALABAMA
1942 AGRICULTURAL CONSERVATION PROGRAM
Liming for Better Pastures
SERVING FARMERS OVER A QUARTER CENTURY
CARBON
The CARBON LIMESTONE Co.
1504 Central Tower, Youngstown, O.
L-I-M-E
BUY YOUR AGRICULTURAL LIME
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Maymead Lime Co.
WHY?
It is ground from a SOFT ROCK
It more than meets GOVERNMENT specifications
It gives QUICK RESULTS
It tests HIGH
It is GROUND FINE
It has a low content of MOISTURE
It spreads EASILY
We deliver to your FARM
We guarantee WEIGHTS
We guarantee HIGH TESTS
Maymead Lime Co.
Johnson County
Shawna
Tennessee
PHONE MOUNTAIN CITY 2440

Selling the Agstone Market

Crushed stone producers expect 1942 agricultural limestone sales to set record

By BROR NORDBERG

PRODUCERS of crushed limestones and dolomites that meet the chemical requirements for liming the soil are relying on the agricultural market as one source of business to depend upon. The federal Agricultural Adjustment Administration program for soil conservation which provides the funds to pay the farmer for soil-building practices, provided he complies with certain rules and restrictions on planting, has developed a market for agricultural limestone that is significant.

Federal appropriations for the 1943 program have not been determined yet, but in the opinion of AAA officials interviewed, and agricultural limestone producers, the program will go on. The need for more crops is considered more essential than ever before. An AAA official in one of the southern States, where good grade limestone is plentiful, said that he anticipates a shortage of agricultural limestone.

Certain conditions brought on by the war are expected to influence the volume of agstone produced. A shortage of superphosphates is expected to increase the proportionate volume of liming materials sold, generally. In certain farming centers a shortage of farm labor will likely have the reverse effect.

There are two methods set up by the AAA for the purchase of liming materials. One is the issuance of assignments to the farmer which can be turned over to the stone producer as an order for liming material. The other is by contract under what is known as the Grant-of-Aid, or materials program, whereby the producer that is low bidder for a given county—or township in some areas—gets the contract to furnish the requirements for the conservation year. He is then mailed a list of the farms to be furnished, with the tonnages for each. Each farmer had first appeared before his local AAA agent and made his decision as to the amount of the allotment he wanted to take in limestone and in phosphate.

Sales Prospects

Each of the two methods has certain advantages and disadvantages to the producer that affect his merchandising and distribution policies. Contracts are the more desirable, for one reason. Payment is usually made direct to the producer when he has filled all the orders on his contract, which means within a few weeks after fulfillment. Payment is assured. But the execution of a contract does not compel the farmer to get his liming materials from the holder of the contract. He can get his materials from any acceptable source he wishes and arrange for its delivery or get it himself. The company awarded the contract must do a job of merchandising to get the business anyhow. Contracts usually are on a delivered to the farm basis, whether by truck or rail from the plant. Contracts are awarded to the low bidder who meets the specifications set up by the State, even though another bidder might have a far superior product but just failed to meet the price. The company failing to get the contract has the alternative of selling cash business or taking farmers' assignments.

Assignments are based on payment to the farmer at the end of the conservation year. Amounts of limestone to be paid for are calculated on a system of credits to be granted him for maintaining certain farming practices, and the figure on the assignment is based on his fulfilling the pledge. If he fails, at the end of the year his allotment will be insufficient to pay for all the limestone already received and the producer has a job of collection to do or he suffers a loss. Assignments require some form of financing, since payment is not made until as much as 18 months later. They may be made out for the material alone, or for lesser amounts if the farmer wants the delivery charge included, and sometimes the charge for spreading.

Most of the volume of agricultural limestone sold comes under the AAA program. In some areas, nearly all the farmers are identified with the AAA program but certain farmers, who refuse to coöperate, are prospects for cash sales. Some producers coöperate with the conservation program to the extent of selling the farmer on the idea of coöperating with the AAA. In certain areas, such as the blue grass region around Lexington, Ky., large land owners always pay cash and there is no demand for a contract arrangement. Producers also have an opportunity to sell farmers more limestone than they are allowed under the AAA, especially if it is spread and the farmer can see he needs more. Specifications vary considerably in different States, probably due to different findings by the various experiment stations as to what is needed in liming materials. Ohio, for instance, requires that 90 percent pass a 20-mesh sieve and only 20 percent go through 100-mesh. The Carolinas and Tennessee want 100 percent through 10-mesh and about 50 percent minus 100-mesh. Most specifications ask for a minimum of 80 percent, or over, calcium carbonate equivalent.

Pennsylvania prefers 100 percent through 20-mesh and 60 percent minus 100-mesh. The specification states that at least 50 percent total calcium and magnesium oxides be contained, that 1000 lb. of total oxides in each ton go through 20-mesh which would mean 100 percent through 20-mesh if the 50 percent oxides were exactly in that amount. Kentucky requires a calcium and magnesium carbonate equivalent totalling 80 percent and that the stone have 80 percent passing through 10-mesh. The specification stipulates that the percentage of carbonates multiplied by the percentage through 10-mesh not be less than 0.7200, which gives some latitude in gradation for products superior chemically.

Service is an important sales argument. Hired truckers like to do business with the firm that can load them out quickly. The more trips they can make, the more they earn. The trucker can do a lot to swing business to a certain producer and usually is the best "salesman."

Typical examples of literature, advertisements, and government forms used by producers of agricultural limestone. 1—Calendar distributed to the farmers by Hopkinsville Stone Co. Note educational material and record forms for the farmer. 2—Letter sent to prospective buyers by Maymead Lime Co. which serves as a reminder. 3—Information on assignment contracts sent out by the A.A.A. 4—Sample of invitation to bid. 5—Advertisement carried regularly by Carbon Limestone Co. in "Farm and Dairy". 6—A.A.A. Handbook for Alabama. 7—Circular distributed by Maymead Lime Co. at county agents' meetings

Service to the farmer is also important and producers are showing continually more interest in large storage capacities under cover. Production, in many areas, cannot possibly keep up to peak demands. In the northern agricultural States nearly all the volume of liming materials is moved in a few months during the Spring and Fall. Large storage capacities permit these plants to operate during the Summer and Winter months to prepare for the peaks to come. Batching scales, in some plants, have speeded up the operation of loading trucks. A few companies have retail distributing plants in localities remote from the producing plant, where agstone is shipped by rail and stocked for quick truck delivery. Covered storage is also used to keep moisture down, and producers so equipped advertise that their material has a low moisture content which means the farmer will get more stone for his money. In some communities, the product is actually produced wet and settled in ponds to be loaded out in a damp condition. Then there is less loss in hauling the material and spreading it.

Financing

Assignments present a particular merchandising problem. One company, in a highly competitive territory, brings a list of its assignments to a local bank and takes out a loan to cover the total. To pay the interest on the loan, the trucking charge (hired truckers) is discounted 5 percent. This company accepts assignments covering only the limestone cost, or on a delivered basis or even spread in some instances. Other companies, having contracts and assignments, fill assignment orders and wait up to 18 months for payment. Large companies can easily do this.

In anticipation of the danger that the farmer will violate his AAA agreement, one producer that we know of will take assignments on the basis of 70 or 90 percent of the total allotment it calls for. The same company assesses a 6 percent interest charge on assignments to encourage the farmer to pay cash and wait for payment himself direct from the government. In other cases, a discount on lime is given for cash. Still other producers take assignments covering only the cost of the material and the farmer pays for the delivery and spreading. This requires merchandising, since the farmer as a rule doesn't like to pay out anything if he can avoid it. Under this plan, he can buy more lime with AAA help.

On contracts, some companies pay the trucker when he has made delivery which means the company waits only about 30 days for getting it back from the government. Others make the driver wait the 30 days. Whichever policy is best depends upon the local conditions.

Certain producers have purchased spreading equipment and this practice is profitable, at a charge of 30c or more per ton, particularly where there is a need for the service. Farmers usually do not object to this payment since it is such a convenience to them. Trucks with special beds and spreading attachments, as well as manure spreaders, are used.

The progressive producer of agricultural limestone is usually a good advertiser. Some of them advertise in farm papers, over the local radio and use direct mailing pieces.

Soil testing is done by some concerns, using simple litmus paper tests or regulation soil testing kits to show the farmer whether he should apply one, two or even more tons of limestone to the acre. Mechanical pencils and pocket knives are given out to farmers by many concerns. Sign boards are used to direct farmers and truckers to the plant.

1942 Sales Show Increase

In spite of difficulties in making deliveries to farms due to an excess of rainfall in many areas, particularly in the South, the agricultural limestone producers report excellent sales early in 1942 with prospects good for the entire season. The only "fly in the ointment" is that in certain cases war orders for crushed stone concrete aggregate have made it necessary to neglect agstone business. Both producers and A.A.A. officials have urged farmers to buy their agricultural limestone requirements as early as possible because transportation facilities, both rail and truck, may not be available later in the year.

From Wisconsin, the A.A.A. reports up to March in 1942 that orders had been placed for 810,000 tons of agstone, setting an all-time record. North Carolina obtained 289,000 tons of agricultural limestone under the A.A.A. program in 1941, and it has been estimated that 400,000 tons will be required this year. At the beginning of March, 43,396 Virginia farmers participating in the 1942 A.A.A. program had requested 509,453 tons of agstone in lieu of payments, of which 369,451 tons had been delivered. An effort will be made to complete these deliveries before May 31. In Illinois, the agricultural limestone applied in 1941 totalled approximately 2,500,000 tons and a larger tonnage is expected this year. In addition to limestone, about 60,000 tons of rock phosphate were applied in Illinois.

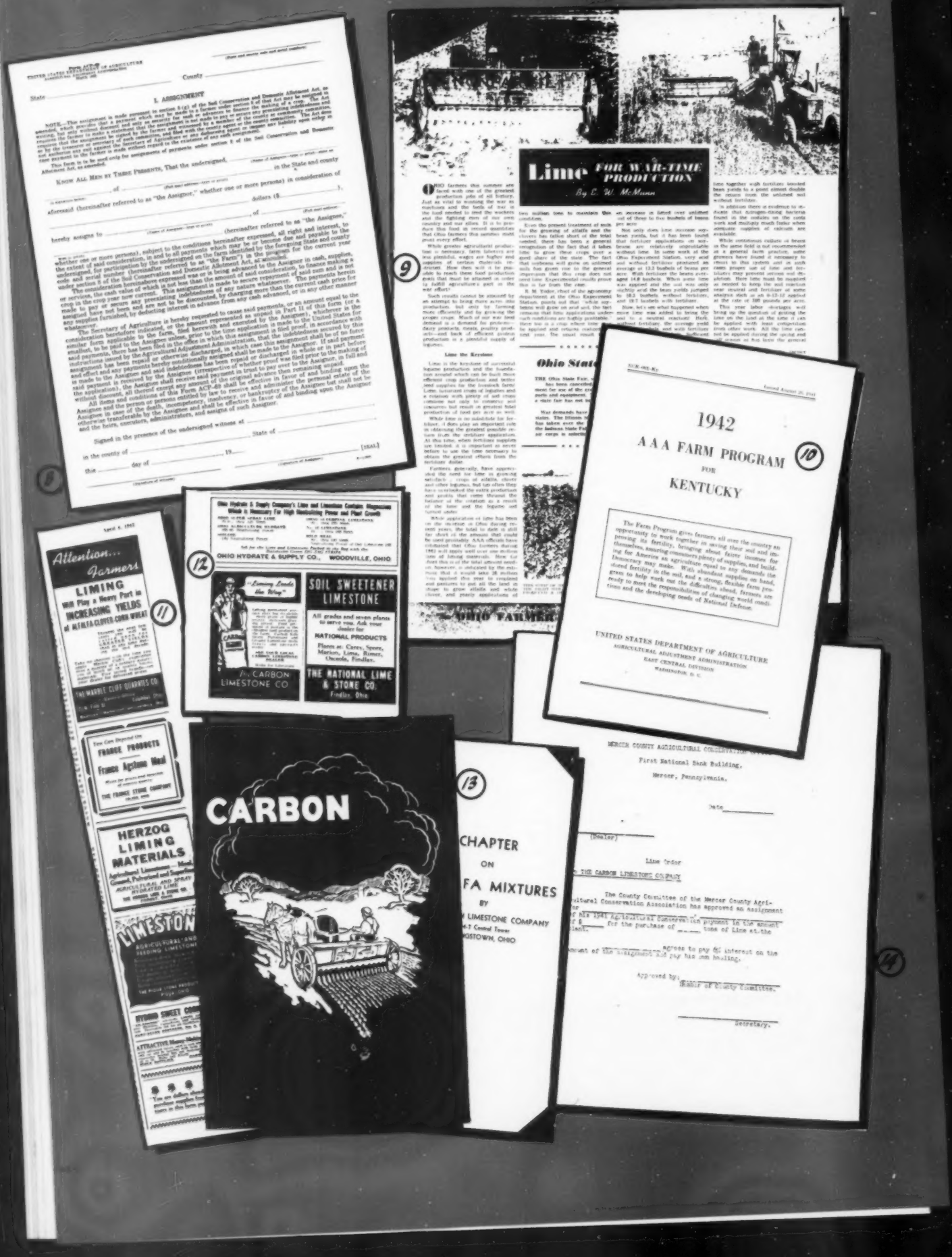
Indiana farmers up to the first of March had spread two-thirds of their entire 1941 total. The 1941 total was 603,000 tons. More than 1,000,000 tons will be applied in this State if deliveries can be obtained. C. J. McCormick, a member of the State A.A.A. committee, reports that trucks are lined up 20 deep at most quarries.

Tires may be obtained for both hauling and spreading of limestone in Illinois, according to a recent ruling by State Administrator Harold Pope of the O.P.A. This is a very important announcement of interest to farmers and producers of limestone.

Agricultural limestone producers in the South have been particularly busy. Kentucky Stone Co., Louisville, Ky., reports 1941 production 25 percent over 1940, and that prospects appear to be good for the balance of the 1942 season. This company operates a plant at High Bridge, Ky., with a capacity of 75 tons per hour of commercial stone, and it built an entirely separate agstone plant in 1940. Crushing at this plant is by means of a 3XB Gruendler hammer mill. At its Mt. Vernon plant, a Day pulverizer produces from 15 to 30 tons of agricultural limestone per hour. Complete details about this company's operations appeared in the May, 1941, issue of Rock Products.

Typical of the expansion in agricultural limestone production in the South is the new production facilities placed in service by the Willingham-Little Stone Co., at Whitestone, north of Atlanta. Additional screening capacity has been added, including a new 4- x 10-ft. triple-deck Productive screen. Hammer mills serve as reduction crushers to produce agstone. With the addition of a new 30- x 40-in. American Pulverizer Co. hammermill the plant now produces nearly 1000 tons per day of 24 hrs.

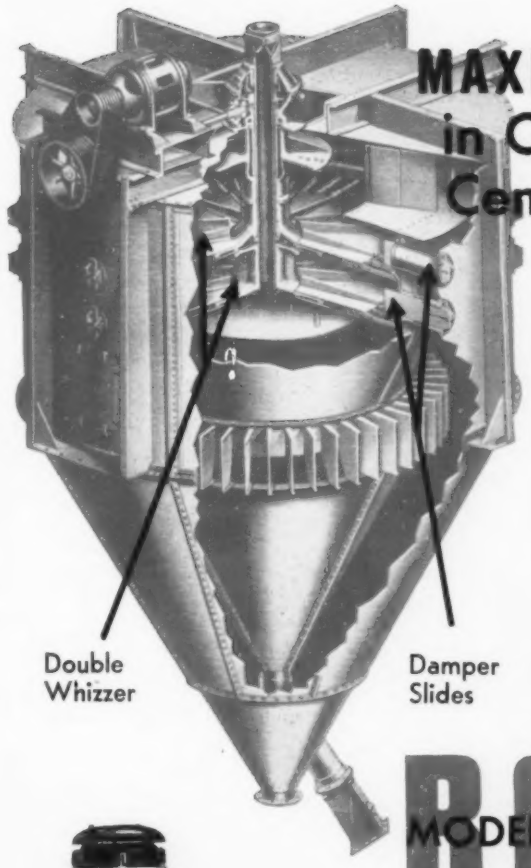
Advertising literature, typical instruction sheets, and articles in farm papers promote the sale of agricultural limestone. 8—Sample of assignment contract form. 9—Article featuring agstone in the "Ohio Farmer". 10—A.A.A. Farm Program for Kentucky. 11-12—Group of advertisements appearing in one issue of a farm magazine. 13—Carbon Limestone Co. sends out this attractive cover folder to farmers and periodically various loose-leaf chapters are mailed for insertion in the folder to serve as a permanent reference file on timely topics. 14—Form used by Carbon Limestone Co. on which copies of assignments are made at the agent's office and then given to the farmer



1

I. ASSIGNMENT

NOTE.—The assignment is made pursuant to section 8 (g) of the Soil Conservation and Domestic Allotment Act, as amended, which provides that a payment which may be made to a farmer under section 8 of that Act may be assigned in writing, but only without discount and only as security for money loaned or advances made during the calendar year in which the payment is made. The assignment is not made to pay or secure any pre-existing indebtedness and requires that the assignee shall sign a statement that the farmer and witnessed by a member of the county committee. The Act does not authorize nor provide for the recognition of any assignment made to any bank, trust company, or other financial agency, or by the farmer to any person who is not



MAXIMUM UNIFORMITY in Classifying Hydrated Lime, Cement and other Materials

with the Double-Whizzer Type MECHANICAL AIR SEPARATOR

The double whizzer feature is a Raymond development that gives closer product control and greatly increased capacities in the extreme fineness range. The vertical damper slides are adjustable from outside, permitting wide range fineness control without interior adjustment.

For superfine grades of hydrated lime, agricultural lime, and chemical hydrate testing 99.9% through 400-mesh, and high surface area cements, Raymond double whizzer Mechanical Air Separators assure high fineness, high uniformity, and high capacity. They are used in the lime, cement, chemical, fertilizer, food and non-metallic minerals industries. They can be operated in closed circuit arrangement with any standard pulverizing unit.

RAYMOND

MODERN LIME PRODUCTION METHODS

LABORATORY SEPARATOR

A small unit, built on same principle as the large Raymond Separators, ideal for classifying test samples.

RAYMOND AUTOMATIC PULVERIZER

equipped with the Whizzer Separator

This is an efficient unit for disintegrating and purifying hydrated lime. It is provided with a throw-out attachment for rejecting impurities.

When large tonnages are to be handled, the Mechanical Air Separator (see upper illustration) can be set up to take lime direct from the hydrator and recover the extreme fines of the good lime, discharging the tailings to the Automatic Pulverizer for refining the remainder of the good lime by removal of impurities.

RAYMOND
Automatic Pulverizer

RAYMOND PULVERIZER DIVISION
COMBUSTION ENGINEERING COMPANY, INC.
1307 North Branch Street CHICAGO

STILL ANOTHER SELECTRO ADDED

..TO FLEET OF SCREENS AT

WILLINGHAM-LITTLE STONE CO.

WHITESTONE, GEORGIA

PROVED PERFORMANCE PROMPTS THE MANY REPEAT ORDERS FOR SELECTROS

The three "SELECTRO" (selective throw) vibrating screens being used by Willingham-Little Stone Co., one of Georgia's largest agricultural limestone producers proved themselves profitable producers to the extent that a fourth "SELECTRO" was recently added to enable them to meet the big demands for their high quality products. The new "SELECTRO" is a 4- x 10-ft., triple-deck vibrating screen.

They are the positive eccentric type screen which imparts a uniform gyrating circle-throw motion to the entire screening surface. Stroke is adjustable to eight distinct intensities by adjustment of the compound eccentric (operating as a simple eccentric) inside the oil cases. The length of the stroke largely determines screening efficiency because conditions such as moisture or temperature-change affect the mass tendency of most materials.

The SELECTRO (selective throw), with its exclusive features, meets all the rigid requirements demanded of the ideal screen. It is dependable—trouble free—economical in performance—simple in design and operation and above all, it costs less to own and less to keep on the job, year in and year out.

PRODUCTIVE EQUIPMENT CORP.

2926-28 WEST LAKE ST. .....CHICAGO, ILL.

MAKERS OF THE FAMOUS "JIGGER" "SELECTRO" GYROSET SCREENS

Henry A. Huschke

War and Soil Liming

Suggest finer materials to obtain maximum availability in soil liming to reduce transportation costs

By HENRY A. HUSCHKE*

FROM THE STANDPOINT of volume, 1941 was a banner year for producers of agricultural liming materials. Although not yet complete the annual survey made by the National Lime Association indicates that the quantity of all materials used will be between 14 and 15 million tons as compared with 13.4 million in 1940. Eight years ago such an increase would have reflected chiefly a prosperous agriculture. Today, it is more nearly a measure of the success of the soil-building feature of the Agricultural Adjustment Program, specifically the grant-of-aid, or materials, program.

Originally designed to provide a means by which farmers without cash or credit could obtain liming material, this program has grown into a gigantic method of supplying annually any coöperating farmer with as much material as his farm can earn. The following table shows how rapidly this procedure has grown.

The agronomist, farmer, and liming material producer will cheer this rapid upward trend in soil liming. It is a simple matter to compute that, for the benefit of farm prosperity and for posterity, annual consumption should be doubled, trebled and quadrupled. The question is, can this trend now be continued? In more nearly normal times it would be reasonably safe to say "yes." Today, however, tires, repair parts, and the hauling capacity of railroads dominate the picture.

Much of the growth of the AAA materials program is due to the fact that the liming material is delivered to individual farmyards, and wherever possible, spread on the fields. This requires trucks, and trucks need tires. When this equipment becomes unserviceable, will the farmer haul his material with his own truck or horses, or will he decide that he has limed enough for several years so why not skip a year or two? Some will continue because they recognize the importance of liming, but the trend will be toward quitting.

The production of most agricultural limestone is intimately tied up with the production of other limestone products. Over two-thirds is made either as a by-product or as a secondary material. The nation's road-building and other non-defense construction is diminishing. As a result the demand for limestone aggregates will decrease and with it the supply of agstone, unless, of course, more of the latter is produced as a primary product.

Manufacturers also are likely to encounter increasing difficulty in obtaining repair and maintenance parts and replacements. To be sure, the AAA materials program has stimulated industry expansion and the capacity to produce may seem to be ample. But, as here and there producing units drop out of the picture, even though temporarily, the distributive structure must be altered. Fewer sources of supply will mean longer average hauls which will be reflected in the final cost to the farmer—another factor that points toward a decrease in future volume.

It is not the purpose of this review to be pessimistic or alarming, but to point out a few of the salient factors that now apply to the production and distribution of soil-liming materials. Since, according to the figures presented in the table below, the AAA is presently the one large buyer of agricultural limestone, it is timely to state that the tire and truck problem is a matter of grave concern to this agency. After all, the liming material must be applied to the soil before it earns the title of a "soil-building practice."

This leads us to suggest a possible, or partial solution. It is based upon the fact that over two-thirds of the limestone used in the United States is of the coaser variety. (As a general average about 33 percent of this material is fine enough to pass through a 100-mesh sieve.) It also is based upon the premise that in time of war the primary reason to lime the soil is to enable farmers to produce their quotas of vital food and feed crops. Sound as it may be to use long-lasting material during normal times, this year the farmer's No. 1 job is to make his quota this year—and next year's quota, next year.

With few exceptions, authorities agree that limestone particles small enough to pass through a 100-mesh sieve, become effective in the soil

(Continued on page 58)

	1938	1939	1940	1941
[1] Total Tonnage Used in the U.S.	7,047,560	8,003,176	13,433,615	14,500,000 est.
[2] Tons Distributed by A.A.A.	38.116	682,514	3,275,455	9,773,384
Per Cent of total by A.A.A.	0.54	8.5	24.4	67.3

[1] From National Lime Association annual survey
[2] From A.A.A. Special Programs Division

*Manager, Agricultural Department, National Lime Association, now on leave of absence.

DISPATCHING

Meeting Specifications In Three States

Load out 2400 tons of agstone per day to trucks by means of a weigh batcher

Attractive sign board along highway brings in business

AGRICULTURAL LIMESTONE has been manufactured by the Carbon Limestone Co., Youngstown, Ohio, for over 25 years. However, certain plant operating methods have been developed which are different than those generally used.

The product is intensively merchandised, through a dealer organization built up over the years, and it is made to a definite standard that had gained acceptance long before the government AAA program was started. Federal appropriations at the present time finance the bulk of the sales, but the merchandising organization has been set up for a more permanent business.

The Carbon Limestone Co. manufactures two grades of agricultural limestone. Ground limestone has a fineness of 100 percent minus 10-mesh, 90 percent minus 20-mesh and 50 percent passing the 100. This product comprises the bulk of the sales. It is sold in bulk and usually delivered by trucks. Pulverized limestone, 65 to 80 percent through 100-mesh, is shipped in paper bags, usually by rail on materials program contracts. Both products are guaranteed to test a minimum of 95 percent calcium carbonate equivalent, and to contain less than 0.5 percent moisture when they leave the plant. They are kiln-dried and stocked under covered storage of 45,000 tons capacity.

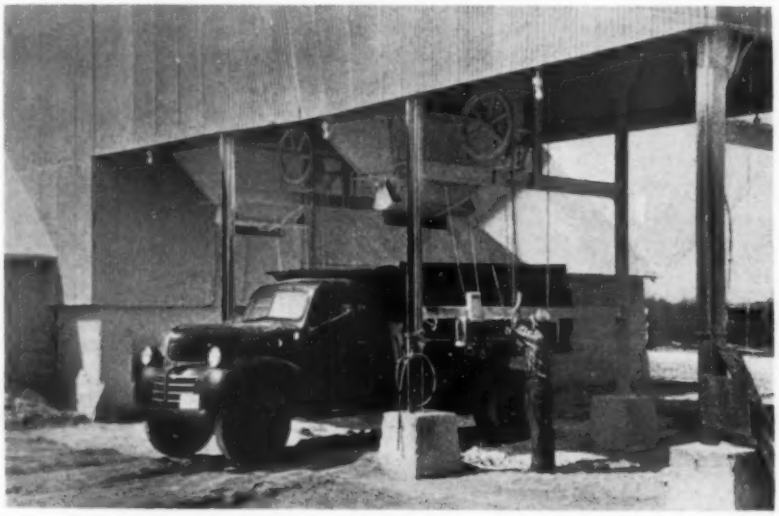
Meet Three State Specifications

The company operates in 15 counties in the State of Ohio, 12 in Western Pennsylvania and three in West Virginia, which involves the meeting of several specifications. Ohio, for instance, requires that 90 percent pass 8-mesh and 20 percent be minus 100-mesh. Pennsylvania asks for a minimum of 50 percent total calcium and magnesium oxides, and that at least 1000 lb. of total oxides in each ton pass 20-mesh. This would mean 100 percent through a 20-mesh if the oxides do not exceed 50 percent. Carbon agricultural limestone is made to the set standard for gradation to which farmers have become accustomed, even though it has to compete with lower grade materials, and is sold on that basis. AAA specifications are always subject to changes.

In the marketing area served by The Carbon Limestone Co. probably 85 percent of the farmers come under the AAA soil conservation program. Agstone for these farmers can be bid in by contract, where the low bidder for any township gets the contract. The other alternative is to accept farmer's assignments. Of course these farmers can be sold more limestone than the government will pay for and non-complying farmers are prospects for cash business.

Carbon Limestone Co. bids materials program contracts in some areas and takes assignments in others. In 1940, the government started the materials program in their section whereby farmers were given limestone in lieu of a check, which was the former procedure. It was then that the company began to take assignments. Assignments are taken on a basis of 90 percent of the amount the farmer will earn if he fulfills his obligations 100 percent, in Pennsylvania, and on the basis of 70 percent in Ohio. This procedure is precautionary, in case the farmer overplants or otherwise violates the AAA provisions. In that case, at the end of the program year, there will be deductions on his allotments and the company would have to collect the difference from the farmer, for limestone already delivered to him. In Ohio, a basis of only 70 percent of farmer's assignments has been worked out because market gardening is prevalent in this section and the farmer can overplant very easily and therefore be subject to deductions.

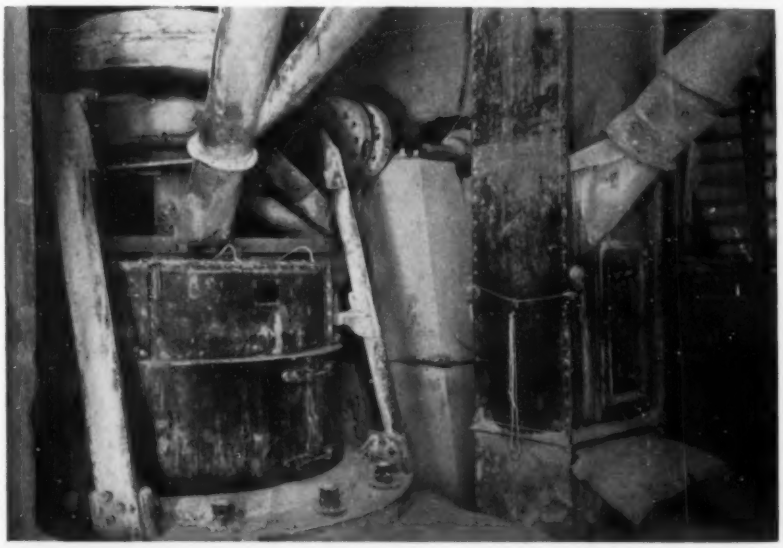
In 1940, out of 300 assignments taken 16 checks were insufficient to pay for the limestone, in amounts ranging from 10 cents to about $10.00. At that time 10 of the 16 assignments were taken on a basis of 100 percent of anticipated earnings by the farmer. In 1941, out of 600 assignments taken,



Over 2400 tons a day are loaded out in trucks by means of weigh batchers on bins

over 50 percent of the checks for payment were received by January, 1942. During 1941, all assignments were made payable directly to the company, instead of to the dealers, some of which do not have enough capital to handle many assignments. This plan is working out satisfactorily.

When assignments are executed in the county offices, a copy is made on the company's form, giving the name and address of the farmer, the number of tons of limestone, the amount and the dealer's name. The form is given to the farmer, who gives it to the dealer that handles the transaction.



Below: Interior of enclosed agstone storage bin. Material is brought in by belt conveyor, above, and is tripped at proper location. Agstone is reclaimed to hopper for batching by 1-cu. yd. scraper

Above: Mill in closed circuit with vibrating screens to produce agstone. Same mill in circuit with air separator is used to obtain dust for dusting coal mines

In 1941, the practice was adopted of charging 6 percent interest on assignments from the date of the assignment to the end of the conservation year, since, without any differential for cash business, the business was converting to assignments with deferred payment. This has helped in part to get some cash business and to compensate for waiting for payment.

In 1940, assignments included the material price and a trucking charge. In 1941, when the amount earned for using a ton of limestone was reduced, assignments were taken on a plant price basis, with the farmer paying the trucking price to the dealer. In this way, the farmer could get more stone.

Carbon agricultural limestone is sold almost 100 percent through dealers and is well advertised. Display advertisements are run regularly in "Farm and Dairy," Ohio's only regional weekly farm newspaper. This publication has a circulation to farmers in six northeastern Ohio counties and is published in Salem, Ohio. An advertisement is carried once a year in the "Ohio Farmer," a Cleveland publication that annually features the liming of soils in one of its issues. Other ads are run in the "Dairymen's Price Reporter," a publication circulated in western Pennsylvania and eastern Ohio.

The company puts out a direct mailing piece that contains much information of value to the farmer. An attractive cover entitled "Carbon" is mailed out to a mailing list of 7000 farmers. Twice a year chapters on certain phases of farm operation are mailed out, to be inserted inside the cover, eventually filling it up into an attractive booklet that contains practical information of the kind needed and desired by farmers.

Advertise Extensively

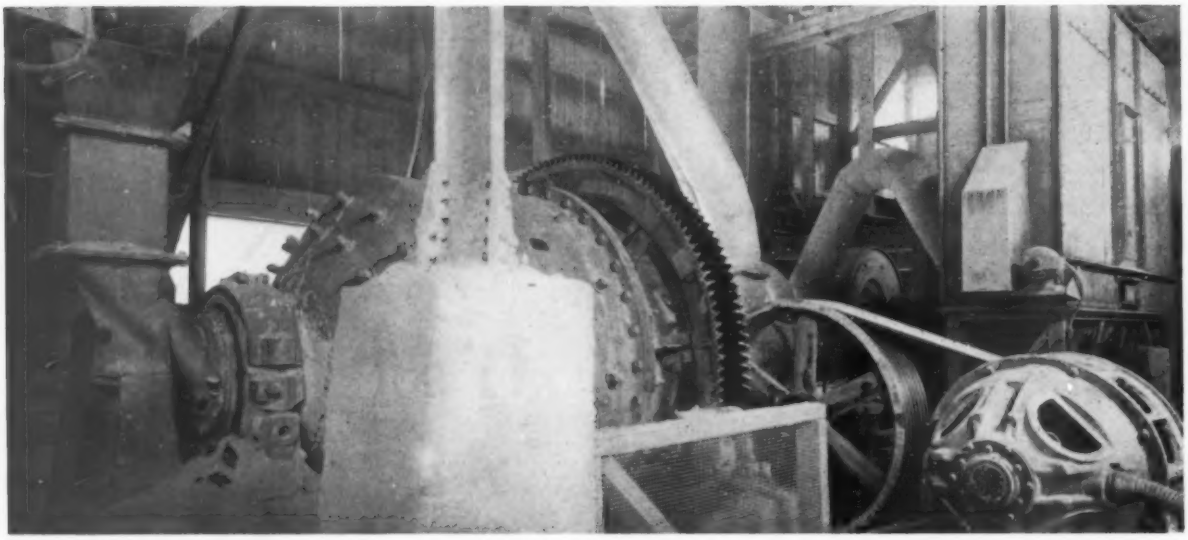
Typical chapters are entitled "Alfalfa Mixtures," "Seeding Alfalfa Mixtures," "Liming for Alfalfa," "Profits from Liming," "What Liming Does," "Improving Permanent Pastures" and "Agricultural Liming Materials." These chapters are written by Philip E. Heim, sales manager of the agricultural division of The Carbon Limestone Co. These pamphlets show the increased yields resulting from liming, and the benefits of liming to correct soil acidity, furnish plant food, promote nitrification, energize humus, and counteract soil poisons. The differences in liming materials, their grades and specifications are contained in one chapter. Another encourages the farmer to send samples of his soil to the State experimental station for test or to the company which is equipped to test the soils.

Several hundred soil tests by Mr. Heim are made annually, preferably at the farms, where the farmer can actually witness the testing procedure. Tests used are the Thiocyanate

(Continued on page 64)

BLENDING FINES

Using Two Systems of Grinding



Ball mill for grinding agstone, showing v-belt drive. Feed enters at the left, and dust collector can be seen to the right

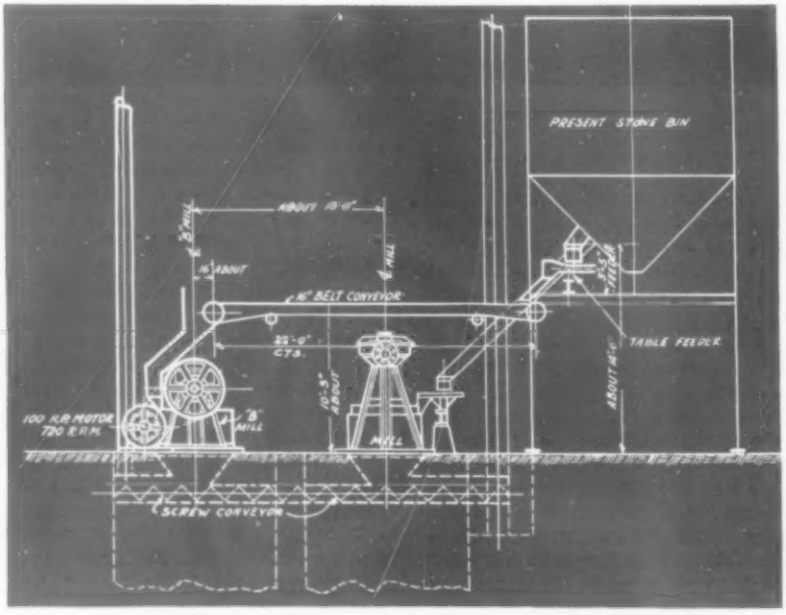
Grind 35,000 tons of surplus screenings resulting from the production of aggregates for Turnpike

As an aftermath to the production of 350,000 tons of crushed limestone for construction of the Pennsylvania Turnpike in 1939 and 1940, the New Enterprise Stone and Lime Co., New Enterprise, Penn., had over 35,000 tons of minus ¼-in. screenings piled up at its Ashcom plant.

In an effort to dispose of the screenings at a profit, the company increased its capacity for agricultural limestone three-fold in 1941 by construction of a new grinding plant. Previously, screenings had been tube-milled into agricultural limestone at the rate of one ton per hour. No positive control of fineness was available in the earlier grinding mill. The mill installed in 1941 is a Hardinge designed plant with a 6-ft. x 36-in. Hardinge ball mill, closed-circuited with a No. 45 Hardinge loop classifier in an air-tight system for grinding. Early in 1942, production was further increased to a daily capacity for 400 tons.

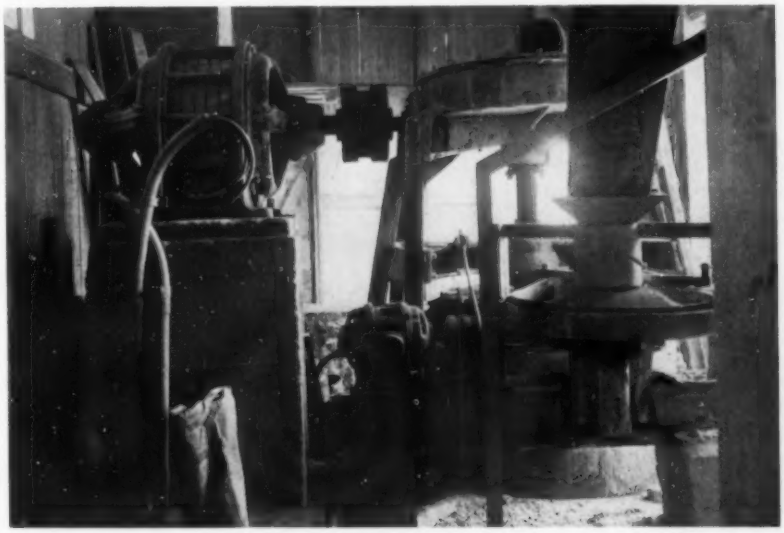
The Hardinge plant was installed to mill mine dust and other fine stone products in addition to agricultural limestone and is probably the first of its kind to grind agstone. Similar equipment is used by the Iron City Sand and Gravel Co., Pittsburgh, Penn., to grind down concrete sand in the production of more fines (Rock Products, September, 1940, pp. 24-26). In the latter plant, a furnace dries the material during the process of grinding.

At the New Enterprise plant, a similar drying system was planned to supersede a separate 3- x 20-ft. oil-fired dryer installed temporarily to



Installation details of two types of mills and methods of feeding

dry screenings taken either from stockpiles or the main plant bins. However, the separate dryer was retained to dry stone for the ball mill as well as for grinding mills more recently installed. Screenings are trucked to a hopper from which a chain bucket elevator feeds the material into the dryer. An adjustable discharge tail-gate on each of the trucks is the means of regulating (cutting down) the rate of feed into the dryer when the screenings run unusually wet. Ball mill feed material is dried to ½ of 1 percent moisture and elevated into a 150-ton steel bin in the grinding plant.



Mill grinding agstone and its table feeder. Stone comes from the same bin from which the tube mill in the other room is fed. Screw conveyor under floor takes product to elevator and then to another screw conveyor into packing machine

Grinding Controlled by "Electric Ear"

Dried screenings are fed into the Hardinge mill by a Hardinge table feeder which is driven by a ⅛-hp. constant speed electric motor. The mill is loaded with spherical steel balls; 3250 lb. of 2½-in., 3775 lb. of 1½-in. and 3775 lb. of 1-in. It is driven through V-belt at 25.7 r.p.m. by a 60-hp. General Electric slip-ring motor.

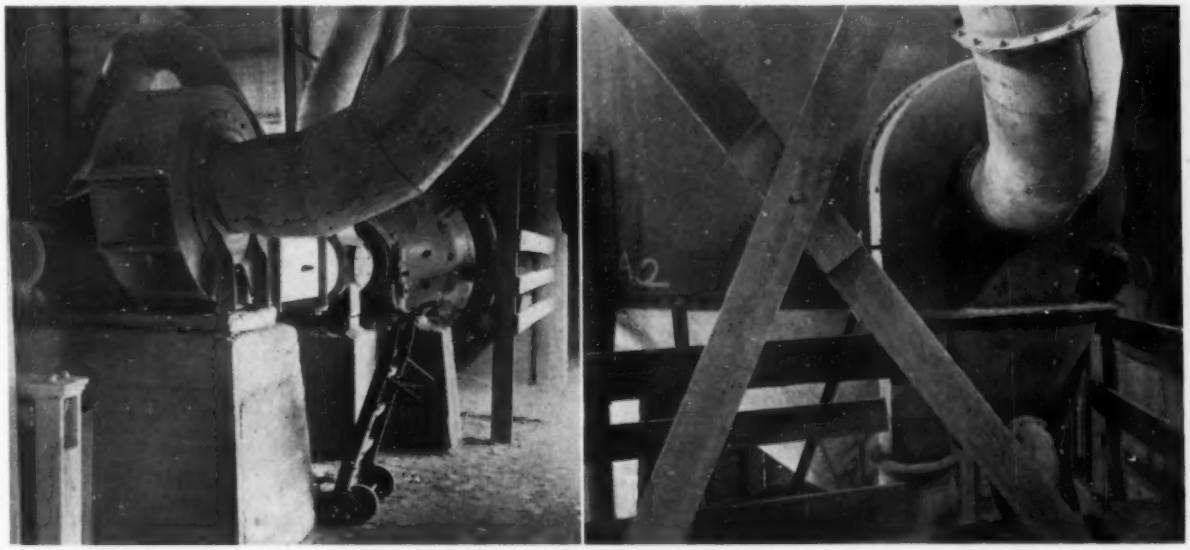
Feed into the mill is regulated by a Hardinge electric ear connected in electric circuit with the table feeder. When the sound indicates there is too much material entering the mill, the feeder automatically stops, and "kicks in" again when the condition has adjusted itself.

Suction in the closed system, created by a No. 17 Kalamazoo centrifugal fan, elevates the mill product to the loop classifier which is adjustable and set to reject particles over the desired size. The fines drop into an 8-ft. diameter cyclone which has an air lock and discharges, on the weight principle, into a 75-ton steel packing machine bin. Rejects return, through a pipe, into the feed end of the ball mill.

The mill circuit is equipped with a Pangborn bag dust collector which draws dust from between the suction fan and the Hardinge conical ball mill.

Production of this mill was three tons per hour of an agricultural limestone with a grading of 100 percent through 20-mesh and 80 percent passing 100-mesh. In addition, 75 lb. per hour of a 325-mesh product is caught by the dust collector, which is bagged and sold for special uses.

The agricultural limestone produced by the ball mill was of much higher grade than most of the products put on the market for the same usage. Pennsylvania requires 100 percent



Left: Ball mill in closed circuit with loop air classifier. Fan in foreground carries fines to classifier. Right: Loop classifier with feed bin for mill in background

minus 20-mesh and asks for 60 percent through 100-mesh.

In enlarging the plant early in 1942, consideration was given to the fact that price competition in meeting government contracts did not favor materials of such superior fineness. The result was that a blended product is now made, but one that still far surpasses the requirements for fines in the agricultural limestone.

In February, a Bradley Hercules Junior mill was installed and a partition was put into the original feed bin to provide dried screenings for feed into the ball mill and coarser stone into the new mill. This mill is fed a 1- to 1¼-in. stone that has been processed through the main plant and which is usually dried. This mill is driven through a flexible coupling by a 150-hp. electric motor and produces 7 to 8 tons per hour. Actual power consumption is about 100-hp.

It is operated with a 14-mesh discharge screen cloth, since its product is blended with the ball mill product. This screen opening is just sufficient to meet Pennsylvania's requirement for 100 percent minus 20-mesh in the finished product, at maximum capacity, depending upon the ball mill product to build up the fines.

Blending Products

Product of the Hercules mill drops into a 12-in. screw conveyor and is elevated and then conveyed by a screw conveyor to drop into the packing machine bin. Thus, the ratio of the products blended in the bin is about 2½:1. They are further blended by the agitation action of the packing machine, which is a 2-spout St. Regis machine recently increased in capacity by the addition of another tube. Finished product runs 70 to 75 percent minus 100-mesh and is packed in 80-lb. paper sacks. A third mill, the new Bradley "B" mill of the short shaft, described in the New Machinery pages of this issue, has just been installed to increase capacity by another eight tons per hour. The screw conveyor carrying the discharge of the Hercules Junior mill has been extended to take the output of both and their combined production will be blended with the ball mill product. This mill is fed by a 16-in. belt conveyor from the same bin and is V-belted to a 100-hp. motor. It may be that 16-mesh discharge screens will have to be used to hold the product to finenesses of 70 to 75 percent through 100-mesh. Bradley Pulverizer Co. designed the additions to the mill. Screenings from the Turnpike have now been reduced to 7000 tons and a shortage of screenings for milling is expected.

Agricultural limestone is sold through a dealer organization and bears the trademark "Fort Bedford Pulverized Limestone." It is guaranteed to have 2 percent magnesium oxide and 50 percent calcium oxide, with 94 percent calcium carbonate of lime.

Nearly all of the plant output is sold in bags. Farmers are accustomed to handling the agstone in bags and find it convenient to store them in their barns during the winter months for application in the Spring. Due to a shortage of established producers in the area, the farmer often finds it necessary to stock the material to insure delivery to his farm.

Very few assignments on the conservation program are taken by the dealers. The company bids for a given county's requirements on contract, either for delivery to the farms by truck or rail. Sales are made in southwestern Pennsylvania and the company supports its dealers with cooperative advertising. A salesman regularly calls on the dealers and makes other needed contacts.

The company also operates crushed stone plants at Roaring Spring and Waterwide, Penn., a sand and gravel plant at Everett, Penn., and is now in the production of ready-mixed concrete at Ashcom and at Roaring Spring where it has also established a Colprovia plant.

J. S. Detwiler is president of the company and Galen Detwiler is manager of the Ashcom plant. Paul Detwiler, secretary-treasurer, has his headquarters at New Enterprise, Penn., Emmert Detwiler is in charge at Waterside and Dale Detwiler operates the Roaring Spring plant.

Conservation

(Continued from page 53)

during the first growing season. Therefore, if a particular field needs 1000 lb. of 100-mesh limestone to do its wartime job, 3000 lb. of the average coarse material would be needed. Of course it would cost more to grind or pulverize the 100-mesh material, but would it cost three times more? The chief consideration, though, is tire, truck and rail conservation. Think of the mileage that could be saved if each truck or freight car carried three times as much immediately effective material as formerly.

The argument can be carried a step farther. If by fineness alone we can increase the wartime utility of present hauling equipment by 300 percent, the use of more concentrated materials will give us an additional conservation. Roughly, a half ton of a good commercial grade of ground burned lime and two-thirds of a ton of hydrated lime contain as much calcium and magnesium oxides as one ton of good commercial limestone, and they act even more quickly in the soil than the 100-mesh limestone.

It is realized fully that to gain the utmost in conservation of hauling equipment it would be necessary quickly to change over the production processes of numerous plants and with it the philosophy of liming. It is unlikely that such a switch-over can or will be made. But the fact remains that the use of finer and more concentrated materials points to a way out and every step in that direction will help.

National Gypsum Developments

M. H. Baker, president of National Gypsum Co., Buffalo, N. Y., told his stockholders: A few typical examples of National Gypsum's contributions to the American war effort are as follows:

(1) National's new rotary kiln, the largest in the world, just put into production at Bellefonte, Penn., has greatly increased the company's output of chemical lime. This type of lime is essential to the manufacture of steel, paper, glass and rubber. During the coming year, Bellefonte and the company's three other lime plants will be largely given over to production for these essential materials.

(2) A large percentage of production at the insulation board plant at Mobile is being used for army cantonments, armament plants, housing for defense workers, and other necessary war construction. Already large quantities have been supplied to army bases in Puerto Rico, the Canal Zone and Newfoundland. A new patented homogeneous insulation board is being widely accepted for roof deck construction in industrial plants.

(3) The company's three rock wool plants, acquired last spring, are manufacturing rock wool for insulating war-craft and merchant vessels and as a sound-deadening material in firing ranges and airplane motor test shacks.

Announcing . . .

a NEW Bradley Pulverizer

Designed expressly for the

AGRICULTURAL LIMESTONE INDUSTRY

and presented after a thorough trial in a large Agricultural Limestone plant.

TYPE 'B' JUNIOR HERCULES MILL
With casings and screens partially removed

LARGE CAPACITY — UNIFORM PRODUCT — FINENESS 100% THRU 20 MESH

Write for Catalog — Our Engineers are at your service

BRADLEY PULVERIZER CO.

ALLENTOWN, PENNA.

SPREAD *Wet* OR *Dry* LIME DIRECT FROM STOCK PILE WITH "NEW LEADER"

Picture below shows a truck being loaded with wet lime direct from the stock-pile. The New Leader positive-feed and self-unloading spreader will spread wet or dry lime. This is made possible by the twelve inch chain conveyor the full length of the box, which is wide open at all times. The feed gate is placed on the end of the box and does not interfere with the positive feed or cause bridging over.

You will find it a pleasure to drive up to a lime quarry and be able to load out of a stock pile instead of waiting in line with possibly twenty or thirty trucks trying to get loaded with dry lime from a bin. We know that by using one of the New Leader Lime Spreaders you will be able to increase your profits to a large extent.

The New Leader will spread uniformly from thirty to forty-five feet in width and you will be able to spread from any minimum of tons to any maximum of tons per acre desired.

Manufacturers of the World's Most Complete Line of Spreaders, including lime spreaders, sand and cinder spreaders, chip rock, clay and dirt spreaders. Write today for our latest catalog.

HIGHWAY EQUIPMENT COMPANY, INC.
CEDAR RAPIDS, IOWA, U. S. A. DEPT B.

A close-up is shown below of the Champion Model chain drive conveyor. Notice excellent design all the way through, also the distributor disc is placed so that it will not interfere with the truck's operation in any way.

BY-PRODUCTS

Recover Agstone From Stone Sand

Precipitated carbonates obtained from sludge overflow in the manufacture of stone sand by a wet process

AGRICULTURAL LIMESTONE has become an important by-product at several quarries of the Bethlehem Steel Co., in Pennsylvania. Its production involves the recovery of sludge in the overflow from the manufacture of stone sand by a wet process. An adequate settling area, dewatering and stockpiling are the essential requirements.

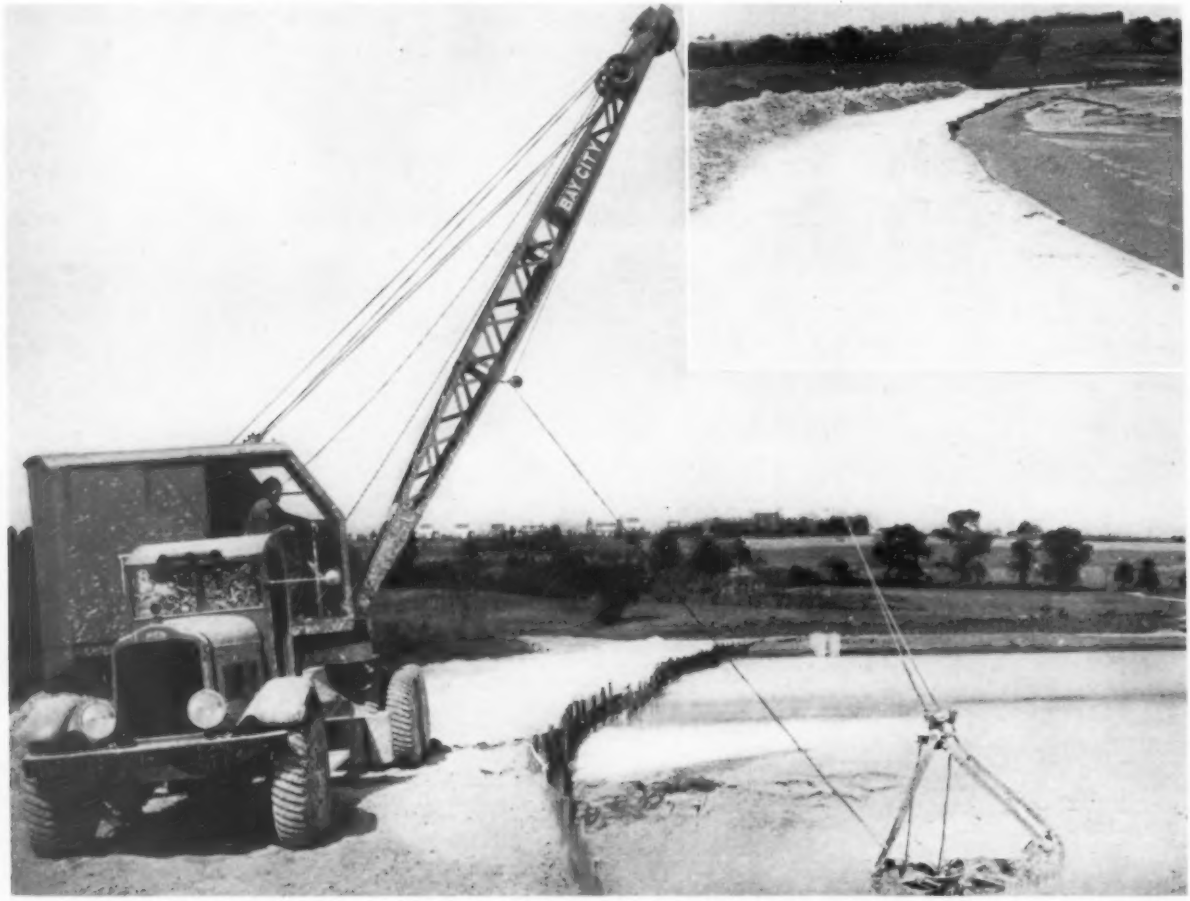
Production of these carbonates, as they are called, is conducted on a larger scale at the Bridgeport, Penn., quarry than in the other plants, but methods used in preparing the material are all similar in this territory.

Bethlehem produces two principal products at Bridgeport—a rice-sized dolomite, which is washed, and a 2- to 5-in. flux, which is unwashed. Combined production is 3000 tons in 16 hours. In the same length of time, 300 tons of stone sand are produced, using a wet process with a ¼-in. minus feed over screens and into classification equipment. An estimated 1400 g.p.m. of water is put through the stone and sand plant.

All the overflow from the washing plant, carrying thousands of tons of fines, drained into a lowland and was held back by an earthen dam. This water travels down a slight grade in open ditches and then through an 18-in. diameter pipe under U. S. highway 202, a distance of one-half mile into this natural depression.

Need Large Settling Area

In 1937 an attempt was made to recover and find a market for these fines but it was not very successful. In 1938, a retaining wall of timber construction was built around an area approximately 170- x 300-ft. in plan



Removing sludge from settling pond with clamshell to be dried out on the bank for agricultural limestone. Insert: Note windrow of material drying on the bank to the left

General view of crushed stone plant and concrete storage silos

to form a settling basin 6 ft. deep. There is a slight slope at the far end where the overflow water goes over a weir and runs off into the original pond. Should the settling area become full, the waste water and fines go to above pond. From this time on the carbonate business assumed more importance and the annual sales volume has been very satisfactory.

At present all the fines are not recovered due to the fact that the market has not grown large enough to take care of so great a tonnage. It is an operation conducted without interference with the production of other stone. Recovery in the settling ponds is estimated at about two-thirds of the material carried in the water overflowing the pond of the washing plant.

Reclaim Sludge with Clamshell

The sludge is reclaimed by a ¾-cu. yd. crane which travels completely around the settling pond, dipping the sludge out and piling it in a windrow for drainage. Recoverable sludge is limited to the area 18 ft. in from the edge of the basin, which is the reaching limit of the crane. The windrow is parallel to the edge of the pond.

The pond is scooped out every Saturday when all the water pumps are down, and the sludge remains in the windrow a day or two, when it is loaded into trucks and stockpiled near the plant. Moisture content is 18 to 20 percent when removed for stockpiling.

Two stockpiles are kept at the plant convenient for loading into customers' trucks and for weighing on platform scales. One pile is being built up while loading from the other to allow for further drying out. Moisture content is about eight percent when sold.

Bethlehem carbonates are guaranteed to contain 49 percent $CaCO_3$ and 39 percent $MgCO_3$, or the equivalent of 27.4 percent CaO and 18.6 percent MgO. Fineness is 99 percent minus 20 mesh and 90 percent through 100 mesh. All prevailing specifications for agricultural stone are easily met.

Construction Records Broken

THE WAR PRODUCTION BOARD has estimated that the nation's building industry, converted almost entirely to military and other essential construction, this year faces the largest construction program in the nation's history.

Its latest estimate of the volume of military and civilian construction such as airfields, war plants, camps, ship yards and war housing scheduled for this year is $13,750,000,000—more than a 20 percent increase over the figure for total construction in 1941 when an all-time record was set.

Non-essential civilian construction, which had been declining sharply since the Fall of last year, was virtually brought to a halt recently when conservation order L-41 became effective.

W.P.B. estimated that construction of the type controlled by L-41 amounted to approximately $4,000,000,000 during 1941.

Further reductions under the order are expected to keep the total of non-essential construction for the entire year to less than one-fourth of 1941.

By shutting down non-essential building, approximately 250,000 laborers now engaged on projects of this type will be freed to work on essential programs.

Total employment on all types of construction, including maintenance and repair, was estimated to be approximately 2,500,000 in February—the last monthly figure available.

To complete the program of military and essential construction, volume must reach about $1,250,000,000 a month, W.P.B. forecast. This will need a labor force of approximately 3,000,000.

With the 2,500,000 already at work on essential construction programs and the 250,000 to be freed from non-essential projects, there is need for approximately 250,000 additional employes to handle the anticipated volume.

Total construction last year amounted to nearly $11,500,000,000, of which nearly $7,500,000,000 was classed as essential. The war board set total construction for this year at approximately $14,750,000,000, divided roughly into $13,800,000,000 essential and $900,000,000 non-essential.

More Mineral Wool for Insulation

NATIONAL MINERAL WOOL ASSOCIATION, New York, N. Y., has announced that the industry will attempt to save 1,867,000 tons of coal and 80,000,000 gal. of oil in 1942 through a program of insulating homes and industrial structures. All mineral wool plants are being geared to maximum capacity to meet the unprecedented demand created by the necessity for conserving fuel. Recognizing the importance of the part regulated domestic heating can play in the conservation campaign, the W.P.B. has ruled that heat losses in new dwellings must be limited to 66 B.t.u. per sq. ft. per hour. The mineral wool industry has made studies of the further economies possible through full-thick insulation, and finds that the small extra carrying charge is more than offset by the reduction in the cost of fuel.

Curtail Truck Manufacture

PRODUCERS of medium and heavy trucks for civilian use were granted an additional 30 days until April 30 by the War Production Board to complete production quotas established for February. Similarly, manufacturers of trucks with a gross weight of 16,000 lb. or more were given until May 31 to complete amended quotas for March. This action was necessary as the manufacturers were unable to finish their quotas in the months for which they were originally given.

Canada Shows the Way!

IN VIEW of the President's message to Congress, April 27, in which he intimated that prices of all commodities would soon be frozen; that he "believed that stabilizing the cost of living will mean that wages in general can and should be kept at existing scales"; even that Congress should "modify" its sacred parity formula so that the cost of food could be kept in line with wages; in view of these long awaited brakes on inflation, the following communication from K. R. Wilson, resident correspondent of the McLean Publishing Co., Ltd., at Ottawa, Canada, should prove interesting to American readers:

Price Control in Canada

"The Canadian price control measure went into effect December 1, 1941. It froze the prices of all commodities and of essential services at the levels which prevailed during the four-week period September 11 to October 15. Only prices of war goods and goods for export were excluded.

"This meant that the prices of cement, cement products, sand and gravel, crushed stone, along with all other commodities, were 'pegged' for the duration, at the prices which had prevailed in the 'base' period. And because Canada pegged wages at the same time, costs were pegged as well as selling prices. A fundamental principle of the Canadian control plan was that you couldn't peg prices without pegging wages as well.

"Canada's price control mechanism first started to work the hour war was declared on Germany — September, 1939. A group of clear-sighted economists and fiscal experts were at Ottawa and had previously drafted laws to create a Wartime Prices and Trade Board. It was given power to keep an eye on the 'necessaries of life'; to avoid bottlenecks of supply; control prices and distribution of essential foods, clothing, shelter.

"For two years this Board kept an increasingly active hand on the controls. Mostly it was concerned with breaking up real or threatened supply shortages—seeing that wool, butter, coal, etc., moved freely into the regular trade channels. There was little recourse to price-fixing except rentals in certain war-congested areas, a temporary price lid on butter, and so forth.

"By midsummer, 1941, the need for more drastic action was apparent. Canada's new comprehensive cost-of-living index had started rising at the rate of more than one percent a month.

"When Prime Minister King introduced his price-freezing program in October, 1941, he declared as well that this wage-fixing plan would be made mandatory on all Canadian workers. He announced the freezing of all salaries. Thus at one blow the Canadian government struck at the very heart of the wage-price spiral. It froze both prices and basic wage rates on the understanding that if there was any further upward rise in prices, wage-earners would benefit to the extent of 25 cents a week for every one-point rise in the cost-of-living.

"Recently it has been necessary to pay subsidies on a wide and increasing list of goods where it has been found impossible to operate within the ceiling. Milk, shoes, groceries, leather, etc., are cases in point. The Prices Board argues that it is cheaper, sounder to pay these subsidies than permit prices to rise. But as yet it has not attempted, in respect of domestic subsidies, to draw the line between essential and non-essential goods. Such a distinction will have to be made very soon, it is argued, even if it means puncturing the ceiling for luxury or non-essential goods."

YOU HAVE GOT TO HAND IT TO UNIVERSAL'S

When it comes to Preparing Ag-Stone!

For year after year they have proved their superior ability in handling fine, damp separations without blinding

The accompanying illustration shows one of three UNIVERSALS in an Illinois Plant, where two grades of agricultural limestone are being produced to meet the demand of its Customers.

Successful performance records of these UNIVERSALS have proved most profitable for the Owner of this Plant.

Damp or dry, wet or just plain sticky, you will find UNIVERSAL the ideal Screen. Get the facts—You will be surprised when you learn how reasonably priced they are.

Write today! No obligations, whatever.

UNIVERSAL VIBRATING SCREEN CO.
RACINE - - WISCONSIN

The Business Paper

√ ***Of*** *the Rock Products industries*

In ROCK PRODUCTS you find "down to earth" basic information on all latest developments and prospects of the industry, well balanced to give each phase of the industry proper attention over the year.

√ *written* ***by*** *men from Rock Products industries*

Very proud are we at ROCK PRODUCTS of our Editors, their engineering background in the industry, the way they are posted on facts, men, methods and machines.

But they're only human, they can't know everything . . . that's why in ROCK PRODUCTS you find regularly specialized articles written by others than our Editors . . . contributed articles by recognized authorities, whom R. P. is glad to pay in cold cash for their valued writings.

√ ***for*** *the men in Rock Products industries*

"How to the line" says N. C. (Rocky) Rockwood to his R. P. editorial assistants and contributors.

While Rocky is hard-hearted and strict about his policies we know he's right . . . the reputation of ROCK PRODUCTS as an authoritative leader is proof. This rigid editorial policy is why the informed men, the buying influences advertisers want to reach, LOOK TO ROCK PRODUCTS.

ROCK PRODUCTS is your Business Paper. Your many responses, suggestions, your few criticisms, your many compliments are very carefully read and studied.

You plant men tell us what you're interested in, the way you like material presented.

The many constant improvements which have been adapted to ROCK PRODUCTS so far in '42 are not to be stopped for so much as a single issue. Times are changing fast. ROCK PRODUCTS will maintain the tempo of the day; will continue to keep ROCK PRODUCTS THE AUTHORITATIVE LEADER.

Rock Products

309 W. JACKSON BOULEVARD

CHICAGO

SALES-MINDED PRODUCER SELECTS *BAUGHMAN* SPREADERS

Agricultural Limestone Sales Rise With Exclusive Truck Deliveries and Spreading Service

Five new *Baughman* Self-Unloading Limestone Spreaders were recently put in use by a prominent midwest Agricultural Limestone Producer whose rapidly expanded business was based on production of quality limestone and providing modern and dependable equipment to properly spread the limestone on farmer's fields.

Baughman Spreaders, the 9 to 1 favorite in 1941, offer full assurance that your limestone will be uniformly spread and their operation is dependable, efficient and economical.

The conveyor-feed *Baughman* Spreader has a specially-designed revolving disc which maintains an even distribution up to 40-ft. in width. An adjustable feed gate controls the amount of limestone spread and while simple in design it is durably constructed.

Baughman Spreaders range in size from 6 to 18 tons, including three models shown here. There is a size and model to fit your plant and market.

Now is the time to equip your plant to offer spreading service as farmers are called on to produce the maximum from their soil. Get the facts on the outstanding *Baughman* Spreaders today.

The Mammoth

The Master

The New Marvel

BAUGHMAN MFG. CO.

Specializing in Spreading Equipment

JERSEYVILLE, ILL.

(Continued from page 55)

Soil Acidity Test developed by the Soils Department of Ohio State University and the Soiltex color chart put out by the Soiltex Co., Lansing, Mich.

Most of the direct calls on farmers are made by dealers, each of which is well known in his community and knows the farmers. These are feed dealers and building supply dealers and so have frequent need to contact the farmers in their territories. Mr. Heim and his salesmen spend considerable time with these dealers and in acquiring new ones, each of which is sold on the advantages of Carbon agstone. The farmer of the future is not overlooked. Boys' 4-H clubs and other organizations are constantly being contacted by the company. Mr. Heim is treasurer of the Processed Lime Association, Inc., Toledo, Ohio, an organization of agricultural limestone producers in the State of Ohio. This Association conducted a school for the sales organizations of its member companies in 1941 and will soon sponsor some cooperative advertising to which each member contributes.

Production Methods

An important feature of the Hillsville, Penn., plant is the large storage capacity under one roof for agricultural limestone and the facilities to load out weighed materials simultaneously into four trucks. It is not uncommon to have over 100 trucks at the plant at one time during the Spring and Fall peak seasons, which must be filled and dispatched as quickly as possible. Quick loading is one of the services which the company plays up in its merchandising and on large sign-boards on the highways leading in the general direction of the plant. As much as 2500 tons of material has been weighed out into trucks in a single 24-hr. day. Trucks are furnished through the dealers.

The Carbon Limestone Co. is a large producer of flux stone and produces commercial stone, stone sand and other stone products. It is one of very few concerns that makes agstone from stone that has been washed and then kiln-dried. Feed material to the agricultural limestone grinding plant is stone of any size, above screenings, up to $1\frac{1}{2}$-in., which is taken direct from the crushers, or bins, for feed into two 7- x 60-ft. stoker-fired rotary dryers.

Dried stone is elevated into a bin over a Bradley Hercules mill which is fed by a table feeder. The mill is in closed-circuit with four 5- x 6-ft. Tyler Hum-mer vibrating screens, over which the stream is split equally. Rejects return into the mill through a spout and the throughs are finished product. The product drops on to a reversible belt conveyor, to fill railroad cars at one end, or transfer in the other direction to a long belt conveyor, to be placed into storage. Production is about 40 tons per hour, with about 90 tons always going through the mill, the difference being the circulating load. Rate of feed into the mill is controlled electrically according to the load carried by the mill. The mill is driven by a 300-hp. electric motor through a flexible coupling, and its discharge screen is not changed in making any of several products. The screen wire on the Hum-mers is changed when pulverized limestone is made. Stainless steel Ton-cap cloth is used, because the stone is hot and condensation would rust and blind ordinary wire cloth. Pulverized limestone is sacked from bins and mine dust is made with the same mill in closed-circuit with a mechanical air separator. Grinding is done at night to hold down the power load.

Total storage is 50,000 tons in two stockhouses, of which 5000 tons is mine dust, 5000 tons pulverized limestone and the balance ground limestone. The new stockhouse is 300 ft. long and is filled by a travelling conveyor belt tripper. The building has concrete side walls 25 ft. up to the eaves, with a sloping roof.

Originally the building was 150 ft. long and 90 ft. wide, with screw conveyors to reclaim the material into batching bins. Six screw conveyors below the floor, lengthwise, convey the stone to two cross screw conveyors at the end of the building, which turn left and right to discharge into a single bucket elevator filling either of three 75-ton batching bins. As progress is made back into the pile, removable covers over the six main conveyors are taken off to allow the stone to flow into them. The conveyors are covered when the stockhouse is filled.

This building was increased another 150-ft. in length, with a 60-ft. width which is considered a more practical width. In this half of the building, a Sauerman 1-cu. yd. bottomless Crescent scraper bucket, operated by a drum-wound endless cable pulls the material to a discharge hopper at the far end of the building. A belt conveyor under the hopper feeds into a bucket elevator filling a 75-ton batching bin. The batching equipment, at all four locations, is Blaw-Knox, with 6-ton weigh batchers. The average truck holds 5 to 6 tons.

From Sand to Agstone

Lincoln Sand and Gravel Co., Lincoln, Ill., has enlarged its activities and provided employment for some of its men and equipment by bidding in the AAA agricultural limestone program for Logan county, in which Lincoln is located. The company does not produce the pulverized limestone, but is a dealer, in Logan county, for approved agricultural limestone produced by the Lehigh Stone Co., Kankakee, Ill.

Processed stone is shipped by rail, a distance of 120 miles, from the producing plant to the company's sand and gravel plant, which has available the facilities and equipment to stockpile it and load it for delivery to the farmers in the county.

Agricultural stone is stockpiled alongside the rail siding by a crane and is re-loaded into end-dump trucks by the crane for farm delivery. A Barber-Greene portable loader will be used when necessary, to release the crane for other duties.

Contracts call for a price for agstone delivered and placed on the farmers' land. The cost of production, freight rate and handling costs sum up to the operating costs which must be absorbed by the Lincoln Sand and Gravel Co. Truckers with spreaders are hired, on contract, for farm delivery.

Shipments began on February 25, and an anticipated 60,000 tons will be moved and placed in the 1942 season. Logan county has one agricultural limestone producer of small capacity, and the restricted amount of available limestone in 1941 did not come up to the county demands.

Lincoln is almost exactly in the center of the county and the maximum haul from the plant is 16 miles. Stockpiles as much as 2000 tons at one time are maintained.

Move Offices

Certain-teed Products Corporation has announced the removal of its general offices from 100 E. 42nd street, New York, N. Y., to 120 S. La Salle St., Chicago, Ill. The New York district sales office, export department and Gypsteel department will remain at the old New York address.

Magnesium From Dolomite By Ferrosilicon Reduction

By D. H. KILLEFFER*

MOUNTING demands for magnesium for war purposes continue to emphasize interest in new processes for its productions. Latest of these employs ferrosilicon to reduce calcined dolomite to free metallic magnesium which is then distilled from the reacting mass. Production of the light metal in the United States has so far been limited to the electrolysis of magnesium chloride obtained from natural brines and from sea water [*News Edition*, 19, 1189 (Nov. 10, 1941)] together with small amounts from the Hansgirg process based on the reduction of calcined magnesite with carbon [*News Edition*, 19, 839 (Aug. 10, 1941)].

A new ferrosilicon process has been developed by L. M. Pidgeon, of the Canadian National Research Council. Dr. Pidgeon found that the reaction between ferrosilicon and magnesium oxide proceeds smoothly at practicable temperatures under vacuum in the presence of calcium oxide. Metallic magnesium distills readily at the reaction temperature and condenses in extraordinary purity as a crystalline lining in a condenser tube connected with the reaction retort.

The process consists of briquetting ground ferrosilicon (75 percent or higher silicon content is preferred) with dead burnt dolomite and heating these briquets in an alloy steel retort to about 1150 deg. C. The retort is constructed with an integral condenser tube into which a removable, tubular steel lining fits. The retort and condenser are evacuated to low pressure (a fraction of a millimeter), and as the reaction proceeds, pure metallic magnesium condenses in the lining of the condenser. At the end of the run—including time for evacuation, the cycle is about 6 hours—the condenser liner is removed with its accumulated magnesium. Differential contraction of the steel and magnesium breaks the two apart and the magnesium "pipe" is ready to go to the foundry without further purification or treatment. The retorts used resemble those of the zinc industry and can be heated in any convenient manner, using gas, coal, or electric heat.

The advantages claimed for this process are several. The process equipment is comparatively simple: cast alloy steel retorts which embody a minimum of machine finishing, furnaces for heating the retorts, and vacuum pumps to evacuate them. Dolomite is plentiful and easily calcined in standard lime-kiln equipment. Ferrosilicon is made in this country on a huge scale in standard electric furnace equipment from plentiful raw materials. The reaction proceeds smoothly without hazard. No evolution or handling of gases is involved, and when the retorts are opened, the magnesium is in solid massive form precluding the possibility of explosion or fire. Special emphasis is placed on the relatively low investment in plant required and on the speed with which units can be built in the present emergency. Furthermore, pilot plant operation to date has amply proved the process, and construction of production plants is already under way.

Several companies have become actively interested in putting this process to work. In Canada, Dominion Magnesium, Ltd., is operating a pilot-scale plant. This operation is in process of being enlarged to 10 tons per day. The process depends on the simple reaction between magnesium oxide and elementary silicon contained in ferrosilicon:

$$2MgO + Si = 2Mg + SiO_2$$

Subsequent reaction between the SiO_2 formed and the calcium oxide of the charge forms infusible dicalcium silicate that can be easily removed from the retort at the end of the run without slagging. No gas is evolved or involved in the process. Based on this reaction, each pound of silicon in the charge should theoretically produce 1.73 pounds of metallic magnesium. In terms of 75 percent ferrosilicon, each pound of magnesium produced requires practically 1 pound of alloy.

The simplicity of the operation depends further on the fact that a powerful reducing agent, ferrosilicon, is supplied to the process. This must be manufactured elsewhere, and although the raw materials required for it are plentiful, the energy needed is high and the demand for the product by the steel industry is great. Production of ferrosilicon of all grades in the United States in 1940 was 406,699 net tons. The average silicon content of this entire output was 28 percent. Included in the total are alloys containing as little as 7 percent and as much as 95 per cent elementary silicon. The lower grades were produced in blast furnaces, whose total output was 190,310 tons. Electric furnace operation supplied 219,141 tons of higher concentration alloys and 248 tons were produced as a by-product of electric furnace abrasives. Present rate of production is over 700,000 tons per annum.

Because of the need for ferrosilicon in war work, the present fixed price ceiling for the 75 percent grade is $135 per net ton. On this basis and assuming that ferrosilicon of the required grade is available in sufficient quantity, the cost of magnesium by the Pidgeon process should be well below the present market price of 22.5 cents per pound.

When these facts are considered with the obvious advantages of the process and the further consideration that the operation can be carried out in relatively small and widely distributed units, the desirability of utilizing ferrosilicon as a reducing agent with dolomite in the expanded magnesium program at once becomes patent.

More Data

Variations of the processes to be employed by other companies, according to *Engineering and Mining Journal*, including Electro Metallurgical Co., use refractory retort, internal heating, and other important variations of the same fundamental principle. These variations make the process quite different than normal zinc metallurgy, from which much of the Pidgeon process technic has been adapted. It is important to note that all of these processes are of the batch type. But with large retorts which are used by some companies, a very substantial quantity of material can be produced per charge.

Some experiments have been made in the United States on the use of calcium carbide as the reducing agent. No commercialization is yet planned, probably because of the larger power requirement. However, the carbide method is in use in Australia following the developments of Murex, Ltd. That process heats together finely ground carbide with calcined magnesite in a vacuum. The vapor of crude metal is condensed to a solid and then purified by melting under a suitable flux.

(Continued on page 68)

*March 25, 1942, issue of **Chemical and Engineering News (Industrial and Engineering Chemistry, news edition)**.

†Contributing Editor of above publications.

Calcining Rates of Limestone

Experiments lead to development of simple computations to determine calcination rates

By RALPH GIBBS*

IN a recent article* Mr. Azbe presents some extremely interesting data on the calcining rate of a high calcium limestone specimen. This nicely performed experiment was conducted on a sphere 2 in. in diameter suspended from a weighing balance while thermocouples revealed the temperatures at the center of the sphere, the surface of the sphere, and the furnace during the time the experiment was conducted.

No doubt much additional information can be derived from this basic data, and such a beginning has been made by the writer

Of more or less interest to those occupied with the burning of lime is the subject of the calcining rate of limestone. The data of the above mentioned article supplies many of the necessary facts required to compute this data, at least for the type of stone used in the experiment, and possibly to establish general laws that will apply to any and all.

With this object as the incentive, the writer has attempted to develop such information from the available data.

Curves 1, 2, 3 and 4 of Fig. 1 are substantially those given originally in the reference article.

The best approach to the solution of the problem seemed to be through the concept of concentric spherical layers. Thus, assuming that the specimen is homogeneous in structure and composition, that portion of the specimen undergoing active calcination can be considered as a concentric layer in the sphere, this layer penetrating deeper and deeper as the calcination proceeds. Although this zone of active calcination undoubtedly has some depth or thickness, for the present purpose it can be considered merely as a spherical surface. Consequently we can interpret the weight lost during the calcining process as that lost by the volume between the active calcining surface and the surface of the 2-in. sphere.

Table 1, column A, shows the diameters of spheres† used in this computation.

Since the limestone specimen consists of 43 percent by weight of volatile matter, and depending upon the homogeniety of the specimen, we can assume that each volume unit of the stone carries its equal and proportional share of the volatile material. Then the volume of each concentric shell or layer corresponds to some definite quantity of volatile matter. Thus we can proportion the last weight-percent and the diameter of the sphere of active calcining surface. Table II shows the results of this calculation.

In Table 2, column A shows the

*Rock Products, p. 62, March, 1942.

* Consulting chemical engineer.

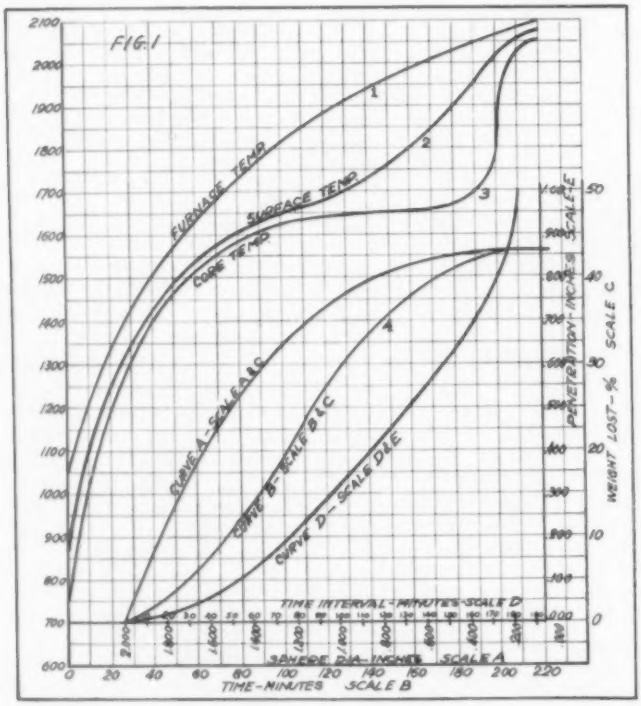


FIG. 1
FURNACE TEMP
SURFACE TEMP
CORE TEMP
CURVE A - SCALE A
CURVE B - SCALE B & C
CURVE D - SCALE D & E
TIME INTERVAL - MINUTES - SCALE D
SPHERE DIA - INCHES SCALE A
TIME - MINUTES SCALE B
PENETRATION - INCHES SCALE C
WEIGHT LOST - % SCALE E

Left: Fig. 1: Curves provide graphic method of determining penetration of calcination in spheres of limestone

Below: Fig. 2: Shows calculated and curve-defined points based on equation

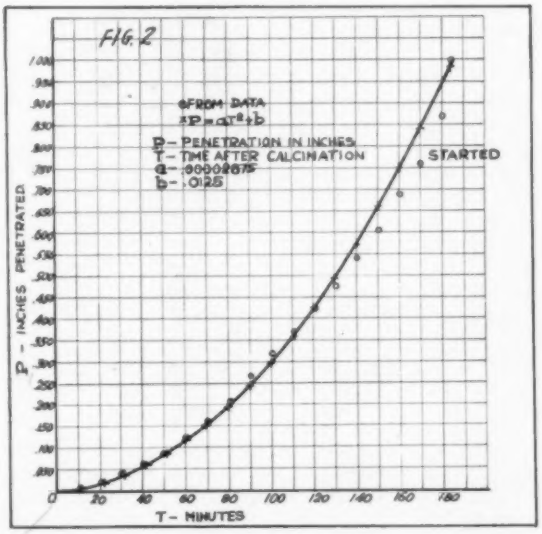


TABLE 1: DIAMETERS OF SPHERES USED IN COMPUTATIONS

A Sphere Diam. Inches	B Volume of Sphere cu. inches	C Diff. between Succeeding Volumes
2.0000	4.1890	
1.9375	3.8080	.3810
1.8750	3.4510	.3570
1.8125	3.1180	.3330
1.7500	2.8060	.3120
1.6875	2.5160	.2900
1.6250	2.2470	.2690
1.5625	1.9970	.2500
1.5000	1.7670	.2300
1.4375	1.5550	.2120
1.3750	1.3610	.1940
1.3125	1.1840	.1770
1.2500	1.0230	.1610
1.1875	.8770	.1460
1.1250	.7460	.1310
1.0625	.6280	.1180
1.0000	.5230	.1050
.9375	.4310	.0920
.8750	.3507	.0803
.8125	.2808	.0699
.7500	.2209	.0599
.6875	.1701	.0508
.6250	.1278	.0423
.5625	.0932	.0346
.5000	.0655	.0277
.4375	.0439	.0216
.3750	.0276	.0163
.3125	.0160	.0116
.2500	.0082	.0078
.1875	.0035	.0047
.1250	.0010	.0025
.0625	.0001	.0009
.0000	.0000	.0001

two diameters used; column B shows the volume difference between successive concentric spherical surfaces corresponding to the chosen diameters; and column C shows the spherical layer volume in terms of percentage of the total volume of the 2-in. sphere. Column D shows the weight loss percentage corresponding to each spherical layer. The total of the individual percentages should be equal to 43 percent, the total of the volatile matter in the entire 2-in. sphere. The results of this computation are shown graphically by curve A in Fig. 1.

†Kent's Mechanical Handbook.

TABLE 2: CALCULATION OF VOLUME LOSS IN CALCINATION

A Diameters Inches	B Diff. in Volumes Cu. In.	C Percent of Volume of 2-in. Sphere	D Corresp. Percent Weight Loss
2.0000—1.9375	.3810	9.10	3.900
1.9375—1.8750	.3570	8.53	3.660
1.8750—1.8125	.3330	7.95	3.420
1.8125—1.7500	.3120	7.45	3.200
1.7500—1.6875	.2900	6.93	2.980
1.6875—1.6250	.2690	6.43	2.760
1.6250—1.5625	.2500	5.98	2.570
1.5625—1.5000	.2300	5.50	2.360
1.5000—1.4375	.2120	5.07	2.180
1.4375—1.3750	.1940	4.64	1.990
1.3750—1.3125	.1770	4.23	1.820
1.3125—1.2500	.1610	3.83	1.645
1.2500—1.1875	.1460	3.49	1.500
1.1875—1.1250	.1310	3.13	1.345
1.1250—1.0625	.1180	2.82	1.210
1.0625—1.0000	.1050	2.51	1.080
1.0000— .9375	.0920	2.20	.945
.9375— .8750	.0803	1.92	.826
.8750— .8125	.0699	1.67	.718
.8125— .7500	.0599	1.43	.615
.7500— .6875	.0508	1.21	.520
.6875— .6250	.0423	1.01	.435
.6250— .5625	.0346	.83	.356
.5625— .5000	.0277	.66	.284
.5000— .4375	.0216	.52	.224
.4375— .3750	.0163	.39	.168
.3750— .3125	.0116	.28	.120
.3125— .2500	.0078	.19	.082
.2500— .1875	.0047	.11	.047
.1875— .1250	.0025	.06	.026
.1250— .0625	.0009	.02	.009
.0625— .0000	.0001	.....	.....
TOTAL.....	4.1890	100.00	42.995

TABLE 3: PENETRATION OF CALCINATION

A Time from Start of Calcination Minutes	B Percent Weight Lost	C Corresponding Sphere Diameter Inches	D Penetration 2"—Col. C 2 Inches
10	1.25	1.980	.0100
20	3.00	1.952	.0240
30	5.00	1.920	.0400
40	7.70	1.877	.0615
50	10.70	1.840	.0800
60	14.10	1.750	.1250
70	17.70	1.675	.1625
80	21.70	1.580	.2100
90	25.80	1.468	.2660
100	29.25	1.368	.3160
110	32.10	1.262	.3690
120	34.10	1.160	.4200
130	36.75	1.050	.4750
140	38.80	.920	.5400
150	40.30	.790	.6050
160	41.60	.620	.6900
170	42.40	.480	.7600
180	42.90	.260	.8700
184	43.00	.000	1.0000

In order to compute the penetration or the position of the actively calcining spherical surface, we must use curves 1-A and 1-B and add the additional scales D and E. Scale D is that of the time intervals from the beginning of calcination. Scale E is the penetration or distance of the actively calcining surface from the surface of the 2-in. sphere.

The method used to develop the data for curve D is to choose successive time intervals (10 minutes) and where these intersect curve B, determine the corresponding sphere diameter (curve A). The difference between these diameters and the 2-in. diameter is twice the thickness of the calcined layer, and the penetration is thus determined. Table 3 shows the data thus obtained.

Table 4 shows the data computed.

Curve D in Fig. 1 shows graphically the relation between the time and penetration.

A mathematical relation between time and penetration is highly desirable, and the writer has developed an emperical relation which, although not absolutely accurate, can be used for all practical purposes. This relation is as follows:

$$P = aT^2 + b$$

where P is the penetration in inches.

T is the time, in minutes, from start of calcination.

a is a constant of value .00002875.

b is a constant of value .0125.

Fig. 2 shows the calculated and

TABLE 4: COMPUTED DATA ON PENETRATION

A Time from start of Calcination Minutes	B Temp. Diff. Furnace and Core—°F	C Penetration Inches	D Inches Penetrated per Minute per °F Difference
10	110	.010	.0000091
20	110	.024	.0000109
30	115	.040	.0000116
40	135	.062	.0000114
50	145	.080	.0000111
60	170	.125	.0000122
70	190	.163	.0000118
80	210	.210	.0000125
90	235	.266	.0000126
100	255	.316	.0000124
110	280	.369	.0000120
120	305	.420	.0000115
130	325	.475	.0000112
140	355	.540	.0000109
150	370	.605	.0000109
160	365	.690	.0000118
170	345	.760	.0000129
180	Calcination about completed.		

curve-defined points on the graph.

The time, temperature-difference rate of penetration is determined from curves 1, 3, and D of Fig. 1.

From the figures in Table 4, column D, it appears that the inches penetrated per minute per degree temperature difference between core and furnace is fairly constant.

Magnesium from Dolomite

(Continued from page 65)

As announced in ROCK PRODUCTS, March, 1942, p. 61, the firm of Singmaster and Breyer, New York City, is designing most of the plants in this country to use the Pidgeon process for recovering magnesium from dolomitic lime. An article by Frank A. Breyer of this firm in the April issue of *Chemical and Metallurgical Engineering* gives the following data in connection with equipment, capacities and costs.

The process is similar to ordinary commercial zinc practice. It differs only in the fact that the retorts for distilling magnesium are of metal instead of fire clay, and the distillation takes place under vacuum in the case of magnesium, whereas zinc is distilled at atmospheric pressure.

The retorts are approximately the same size as used for zinc, the operating temperatures are the same, and the quantity of magnesium recovered per retort per day (40-60 lb.) is the same as recovered from a zinc retort. When the recoverable zinc in zinc ore costs the zinc distiller 2.5c per lb., metal can be produced by the retort process and sold at a profit of 6c per lb.

The fact that the retorts are small and the amount of magnesium collected and removed at one time is limited to 15-20 lb., and the fact that the charging and discharging of the retorts is carried out after the breaking of the vacuum and the admission of air to the retort establishing ordinary pressures means that the fire and explosion hazard is reduced to a minimum.

The size of a plant is dependent upon the number of retorts operated. A bank of retorts is set in a heating chamber and constitutes a furnace. The larger the furnaces and the more of them, the easier it is to establish the maneuvers necessary to hand charge and hand discharge the retorts and remove the residues economically. Handling facilities for placing and replacing the retorts are also simplified and cheaper with the large scale operations.

The principal items of operating cost are:

1—Ferro-silicon
2—Metallic retort maintenance
3—Heat
4—Maintenance of vacuum equipment
5—Labor
6—Burnt dolomite
7—Maintenance of electric heaters
8—Power for crushing, grinding, briquetting

First estimates of capital cost for a 10-ton per day plant indicate $1.25 to $1.50 capital outlay for each dollar's worth of sales per year. This is figuring the magnesium as selling at 25c per lb. under present conditions. This is only slightly above the capital costs per annual sales dollar of product of most chemical and metallurgical operations and is very much below the figures that may be calculated from the published data for any other magnesium process.

A Pidgeon process plant could be built and put into operation in a much shorter time than any other magnesium process.

Preventing Premature Shots

HAZARDS from premature explosion while springing or chambering of deep holes are so often disregarded that the Bureau of Mines has issued an Information Circular, I.C. 7191, by D. Harrington and C. W. Owings, to acquaint the quarrying and mining industries with the dangers and the safe methods.

The bulletin points out that premature explosions while holes are being sprung or sprung holes are being charged usually result from heating of the holes by the springing shots or from burning paper at the bottom of the hole. The danger increases progressively with several springings and with the length of time required for loading. An appreciable amount of time may be required in some instances to raise the temperature of the explosive to the danger point; or, if the explosive starts to burn, an appreciable time may be required before the pressure necessary to cause detonation is reached. Springing shots may often require only about five minutes to load and fire, whereas main charges may require one-half hour or more. The larger the springing charge, the greater the amount of heat liberated by it and the greater is the likelihood of heating the surrounding rock and the succeeding charge of explosives.

When natural cooling is depended upon, some rules suggest a minimum of two hours between shots, and this may be long enough in some instances; but where more than 10 lb. of explosives is used in a springing hole, the safest time limit appears to be 24 hours. Where compressed air is used to blow out the hole, it appears advisable to wait two hours before charging the hole. Water is the safest means of cooling the borehole. Gelatin dynamites are best suited for wet work. Care must be exercised, however, in using gelatin dynamite not to allow it to remain in the water too long. After long exposure to water it is possible that nitroglycerin may have separated; this condition may have been responsible for a number of premature explosions.

The Bureau of Mines also called attention to the fact that most premature explosions have occurred in the summer months.

Chalk and Whiting*

Increasing market for finely ground limestone products pointed out by Bureau of Mines report

By OLIVER BOWLES†

WHITING OR PARIS WHITE is a fine-grained preparation of calcium carbonate having a wide variety of uses. Until recent years it was prepared almost exclusively from certain north European chalks. With the curtailment of imports of European chalk during the World War of 1914-18, however, finely ground limestone of domestic origin was used more extensively to satisfy the American demand.

To encourage the domestic industry, the Bureau of Mines in 1931 undertook a study of the preparation of whiting from United States raw materials. As a part of this study, domestic products were compared with European whitings, and a detailed report on results has been issued.[1] Some of the material in the present publication has been abstracted from that report, but most of it is a revision of an earlier report by Bowles.[2]

Acknowledgment is made to Dr. Duncan McConnell, former assistant mineral economist of the Bureau of Mines, for valuable assistance in compiling certain section of this report.

Definitions

The following definitions will clarify the text that follows:

LIMESTONE—Any natural, stratified rock composed principally of calcium carbonate, the double carbonate of calcium and magnesium, or intermediate mixtures of the two carbonates. Limestones containing 5 to 20 percent MgO are known as magnesium limestones and those of more than 20 percent MgO as dolomitic limestones.

MARBLE—A variety of limestone in which the essential carbonate constituents have been completely recrystallized to form an interlocking structure, resulting in a dense stone capable of being polished.

MARL—This term (which has suffered from rather indefinite usage) is properly applied to unconsolidated deposits high in calcareous material. Rarely is it pure enough for use as whiting.

CHALK—Considerable confusion attends the use of the term "chalk," but it may be defined as a fine-grain, light-color variety of friable limestone composed of the calcareous remains of microscopic marine organisms. It is usually dull, earthy, or opaque in appearance, but it is not "amorphous."[3]

The micro-organisms contributing to the formation of chalk are chiefly coccolithophores and rhabdoliths, although the remains of foraminifera usually are present also. The chalk beds of both northwestern Europe and North America are of Cretaceous age. The American deposits are true chalks in every sense and show marked similarity to European chalks in composition and physical properties.

WHITING — Finely ground, pulverized, powdered, or chemically precipitated calcium carbonate of good white color is known as whiting. The Bureau of Mines recognizes different classes of whiting, according to the raw materials used in their preparation, as follows:[4]

Chalk whiting—prepared from true chalk.

Limestone whiting—prepared from limestone.

Marble whiting — prepared from marble (marble flour).

Dolomite whiting — prepared from dolomite (calcium-magnesium carbonate).

Precipitated whiting—prepared by reaction of milk of lime with carbon dioxide or by some similar chemical reaction (so-called precipitated chalk).

Surface-treated whiting—prepared by various methods involving superficial coating of the particles with certain organic compounds.

The classification of whiting materials presented herein will, it is believed, eliminate some of the confusion that now exists. For example, in the present usage the term "precipitated" does not necessarily indicate that the product was obtained by chemical reactions in processing plants, but it may be used to refer to very finely ground natural materials. "Hard" and "soft" do not seem particularly suited to classification of whitings, and ambiguity immediately arises if the distinction is one involving whether or not the product is ground. Although chalk occurs in nature in a finely divided state (the individual grains being microscopic) and although it is moderately friable in its natural condition, grinding is common practice in its preparation for use as whiting.

Uses and Specifications

The requirements for whiting are quite variable, depending on the several diverse uses, and specifications are lacking except in a few instances. In general, color, fineness, and freedom from grit are important in determining quality. Standard methods for determining certain specific properties have been established, but sales are based largely upon samples.

Market quotations are based upon certain grades, such as commercial, gilders, Paris white, English cliffstone, etc.; but these terms are used loosely and do not guarantee strict uniformity of the product.

CERAMIC WHITING — An important use of whiting is as a constituent of glazes and enamels for ceramic products. Chalk, marble, limestone, or precipitated whiting may be used, chemical purity being an important factor. Ceramic whiting is divided into two classes, both of which must contain not less than 97 percent total carbonates and not more than 0.25 percent iron oxide, 2 percent silica, and 0.1 percent sulfur trioxide. Class

[1] Wilson, Hewitt, and Skinner, Kenneth G., Occurrence, Properties, and Preparation of Limestone and Chalk for Whiting: Bureau of Mines Bull. 395, 1937, 160 pp.

[2] Bowles, Oliver, Chalk, Whiting, and Whiting Substitutes: Bureau of Mines Inf. Circ. 6482, 1931, 13 pp.

[3] Johnston, J., Merwin, H. E., and Williamson, E. D., The Several Forms of Calcium Carbonate: Am. Jour. Sci., ser. 4, vol. 41, 1916, p. 490. Boswell, P.G.H., A Piece of Chalk: Sci. Progress, vol. 28, 1933, pp. 193-202. Wilson, Hewitt, and Skinner, Kenneth G., Work cited, p. 7.

*From Information Circular No. 7197, United States Department of the Interior, Bureau of Mines, February, 1942.

†Assistant Chief, Nonmetal Economics Division, Bureau of Mines.

1 must contain 96 percent or more calcium carbonate and not more than 1 percent magnesium carbonate. Class 2 may contain as much as 8 percent magnesium carbonate and as little as 89 percent calcium carbonate.[5]

PAINTS—Cold-water paints and calcimine are composed essentially of a filler, a pigment, and an organic colloid. Whiting is commonly employed in these products. Whiting is a standard "extender" for flat wall paints and enamel undercoats. Both precipitated whiting and chalk whiting are used, special types of surface-treated whitings being preferable under certain conditions. Factors governing the uses of extenders are (1) particle size and size distribution, (2) textural features, (3) particle shape, (4) chemical reactivity, (5) oil absorption, (6) color, and (7) specific gravity. Because of its low refractive index as compared with white lead and zinc oxide, whiting does not have high opacity or covering power. However, chalk whiting has somewhat better opacity than limestone or marble whiting. This is probably due to the characteristic shapes of the chalk particles, which cause greater scattering of the light.

Although large quantities of whiting are used by the paint industry, specifications for this use have not been published. Chalk whiting is preferred, and about 50 percent of the chalk imports are applied to this use.

RUBBER—The choice of proper fillers in rubber manufacture has a pronounced influence on the quality of the finished product. Fillers perform several functions, such as toughening, diluting, reinforcing, activating, coloring, and increasing heat resistance. Any one particular filler may have favorable properties for one or more purposes but objectionable properties from other standpoints. Rubber manufacturers are more interested in the physical properties of fineness, production of strength, and workability than in chemical composition; nevertheless, whiting for rubber is restricted to types consisting of nearly pure calcium carbonate.

In general, fillers for rubber should have extremely fine particle size, should be easily dispersible, and should have excellent bonding properties with the rubber. Some of the surface-treated whitings have properties superior to untreated materials in these respects.

PUTTY—Whiting and linseed oil usually are the chief constituents of putty, although white lead is sometimes used and may constitute 10 percent or more of the pigment. Other pigments and other carriers also are used. Fineness of grain size and freedom from grit are desirable. Chalk whiting produces a "long" putty with excellent stretching power, which is preferable for certain purposes. "Short" putty, which is adapted to glazing of metal sash, is prepared from whiting of other types. It is claimed that small additions of calcium oxide (quicklime) will promote rapid hardening. Alkali is an objectionable impurity sometimes found in precipitated whitings, particularly in certain byproduct precipitates, and its presence may cause reaction with the linseed oil, resulting in saponification. Low oil absorption is an important consideration in putty. Putties made of imported chalks usually have an oil absorption as low as 15 percent.

Federal specifications for putty for glazing wood sash (TT-P 791a) require the use of chalk whiting and raw linseed oil, whereas the specifications for putty for glazing metal sash (TT-P 781) do not specify the type of pigment to be used.[6] The American Society for Testing Materials has published specifications for putty (D317-33).[7] About 10 percent of all whiting is used in the manufacture of putty.

PAPER—Fillers are employed in paper manufacture to increase opacity and improve printing quality. Precipitated whiting and various finely ground natural whitings are employed as fillers but are used more extensively as coating pigments for printing papers. Many factors must be considered in the choice of proper loading and coating materials, but one requisite is fineness of grain size.

OTHER USES—Many diversified uses of whiting have been developed, but it is not within the scope of this paper to discuss these uses in detail. However, it seems desirable to list some of the products in which whiting is employed, as follows: White ink, fabric filler, dressing for white shoes, soap, cosmetics, crayons, wire insulation, dentifrices, explosives, medicines, metal polish, insecticides, linoleum, oilcloth, gypsum plaster, sealing wax, acoustic tile, paper plastics, stock feeds, cigarette paper, picture-frame molding, roofing cement, calking compounds, dolls, and fireworks. Numerous chemicals and industrial processes utilize whiting in such a way that it is not incorporated in the finished product.

In addition to the material sufficiently light in color to be known as whiting, darker calcium carbonate powders are used as fillers in asphalt, rubber, and fertilizers. Under the name rock dust, pulverized limestone is used for the prevention of dust explosions in coal mines. It is somewhat difficult to draw sharp lines of demarcation between whiting and other calcium carbonate powders; but to deserve the name whiting, the product must be white, or nearly so, and should be ground to pass 200-mesh or finer.

Production

Very little domestic chalk is used in the preparation of whiting, most of which is made from limestone and marble. The records of the Bureau of Mines do not indicate the use of marl as a raw material for whiting. Few marls are white enough for such use.

The only statistics available on domestic production of whiting are for limestone whiting, as given in the following table. These figures may not be complete, because some companies do not report their sales in enough detail to permit segregation of whiting uses.

LIMESTONE WHITING PRODUCED IN THE UNITED STATES, 1931-40

Year	Short tons	Value
1931	73,420	$ 408,880
1932	76,020	386,191
1933	93,070	481,677
1934	97,340	509,893
1935	147,910	563,514
1936	179,110	894,913
1937	194,080	923,494
1938	145,170	671,842
1939	175,460	948,528
1940	207,910	1,242,448

May Reopen Keller Quarry

CHARLES KELLER of Grafton, Ill., recently made an inspection of the Keller quarry at Louisiana, Mo., which may be reopened to furnish aggregates for defense plant construction. The quarry has been closed, except at short intervals, for several years.

[4] Some of these terms have appeared at various times in the literature. For example, "limestone whiting" and "chalk whiting" are to be found in a paper prepared in connection with a public hearing held in the office of the United States Tariff Commission, Washington, D. C., June 20, 1928. See ROCK PRODUCTS, vol. 31, 1928, pp. 74-80.

[5] American Ceramic Society, Standard Specifications for Materials. Ceramic Whiting: Jour. Am. Ceram. Soc., vol. II, 1928, p. 378.

[6] Copies of Federal specifications may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C.

[7] Copies of these specifications may be obtained from the American Society for Testing Materials, 260 Broad Street, Philadelphia, Penn.

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Bigger ~~BIG~~ PAY LOADS with the New #3½ Smith-Mobile!

May be mounted on relatively light, 2-axle truck, if desired.

9 CU. FT. GREATER DRUM VOLUME

165 cu. ft. drum volume of No. 3½ Smith-Mobile permits bigger payloads.

...and yet Smith-Mobile WEIGHS LESS

More Profit Per Load!

Now — you can mix and deliver more concrete on every trip by using the new No. 3½ Smith-Mobile Truck Mixer. It has a drum volume of 165 cu. ft. . . . *nine cubic feet more than competitive 3-yard mixers.* This additional pay load capacity gives ready-mixed concrete operators EXTRA PROFITS with every load. In spite of this big feature, the new No. 3½ Smith-Mobile weighs less than competitive 3-yard machines. Actually, it does NOT require the 6-wheel truck shown in the illustration above, except for unusual load or ground conditions. A relatively light, 2-axle truck is usually all that's needed.

Then consider Smith-Mobile's many other features: HIGH DISCHARGE without hoist . . . CONTROLLED DISCHARGE without segregation . . . VISIBLE MIXING . . . FEED CHUTE CHARGING . . . etc., *the ONLY truck mixer with all these features.* Be sure to get your copy of the new Smith-Mobile Catalog No. 198-B.

THE T. L. SMITH CO. 2885 N. 32nd St., Milwaukee, Wis.

SMITH

SMITH-MOBILE *The Original High-Discharge* TRUCK MIXER & AGITATOR

A 3682-1P

Selling Concrete In A Clay Market

Persistent advertising and promotion plan and quality products build up large market for concrete building units

CONCRETE MASONRY has been slow to gain acceptance as a building material in Atlanta, Ga., and surrounding territory until the past few years. Atlanta builders, architects and the public were used to clay products, made in the city and sold for prices too low to invite any other competition.

Notwithstanding these unfavorable conditions and the added competition of cheap granite stone, John S. Bailey, head of the Concrete Manufacturing Co. of Atlanta, has developed a concrete masonry business of close to a million 8- x 8- x 16-in. equivalent units annually. His business started to grow when he began to make light-weight concrete units by modern power machinery and set out to capitalize on their advantages. Since then it has been a case of intensive promotion and selling that has enabled him to compete, where price competition was out of the question.

Meets Competition with Light-weight Units

Mr. Bailey started in the concrete products business in 1926. He manufactured stone tile at first, and then other heavy concrete products, until 1937 when Superock expanded slag light-weight aggregate was made available. He acquired the license for that aggregate in his territory and, in 1938, modernized his plant and installed a Stearns Joltcrete machine.

These two changes gave him the selling points which he is putting across. He then could offer units which were light enough to meet with the favor of masons and units which were true to accuracy. Attractive walls that could be nailed and which have good insulating and acoustical properties were now available to architects. The light-weight unit opened the way to above ground construction, where most of the volume is found in Atlanta, basements are generally shallow and require comparatively few concrete block.

In 1937, sales volume was 150,000 units. In 1938, it increased to 250,000 units; in 1939, it jumped to 450,000 and reached a peak of 900,000 in 1940. The 1941 figure, which dropped to 700,000, represents many small structures and is therefore more favorable than the year 1940 when two large housing projects took 600,000 units. This year's prospects for sales will consist principally of commercial and industrial buildings, garages, filling stations and some small homes.

Selling concrete masonry in the Atlanta area has been an uphill job and Mr. Bailey did not have the benefits of the sales efforts of competing firms in the concrete products business.

Sizable projects require promotion in order to get concrete masonry into the specifications and Mr. Bailey gives his personal attention to convince architects that his product be written in. The groundwork is laid as soon as he gets a tipoff on the job. The Henry Grady and Eagan housing projects which were both constructed of concrete masonry in 1940 were on his calendar two years before. At that time, when there was much agitation for slum clearance in Atlanta, he began selling the architects on fireproof masonry construction for that kind of work. It might be called speculative promotion, but the result was a total of 600,000 concrete block sold.

Obtains Big Housing Jobs

Atlanta Housing Authority built the two projects, and the architects were Tucker and Howell and Associates. on the Henry Grady project, comprising 548 dwelling units. This project involved 250,000 units which are exposed and painted. The Eagan homes have the same number of dwelling units, but required 350,000 concrete block. On this job, the walls are stuccoed. Architects on the Eagan homes project were Burge and Stevens and Associates. These two jobs have been shown to many architects and building prospects to illustrate what can be accomplished by building with concrete masonry. Construction work for the City of Atlanta is

John S. Bailey, president

M. E. Posey, plant foreman

Roy W. Darden, in charge of sales

MILLIONS *and* MILLIONS *of* B
for DEFENSE FACTORY *and* H

Besser Super Automatic Plain Pallet Vibrapac

A TRIBUTE TO THE CONCRETE PRODUCTS INDUSTRY

Great emergencies have always brought radical changes and basic improvements in those things which affect the vital well being of the people involved.

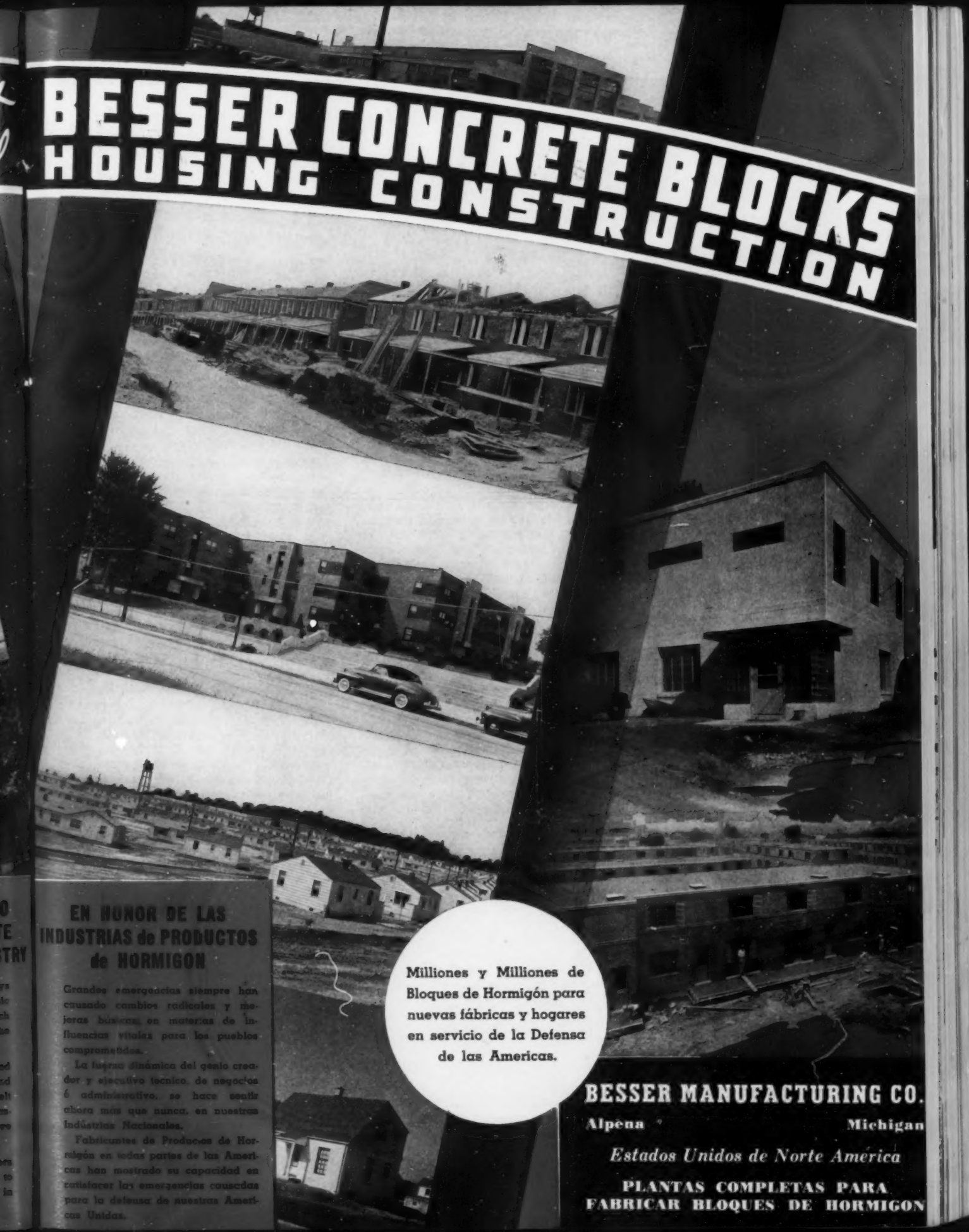
Dynamic force of the creative and executive genius of technical and business leaders is now being felt in industry. Victory is already assured for all free and progressive countries.

Concrete Products Manufacturers everywhere have shown ability to meet the unprecedented situation in Defense construction.

BESSER PLAIN PALLET STRIPPERS

A Besser Plain Pallet Stripper For Every Need

TAMPERS	Besser Super Automatic	8 Hr. Capacity 3120
	Besser Victory Automatic	8 Hr. Capacity 2160
	Besser Semi-Automatic	8 Hr. Capacity 1680
	Besser Champion, Power Operated	8 Hr. Capacity 1000 to 1200
	Besser Multi-Mold, Hand Operated	8 Hr. Capacity 250 to 350
VIBRATORS	Besser Super Automatic Vibrapac	8 Hr. Capacity 4800
	Besser Victory Automatic Vibrapac	8 Hr. Capacity 2160
	Besser Master Vibrapac, Hand Operated	8 Hr. Capacity 800


BESSER CONCRETE BLOCKS
HOUSING CONSTRUCTION
EN HONOR DE LAS INDUSTRIAS de PRODUCTOS de HORMIGON
Grandes emergencias siempre han causado cambios radicales y mejoras básicas en materias de influencias vitales para los pueblos comprometidos.
La fuerza dinámica del genio creador y ejecutivo técnico, de negocios ó administrativo, se hace sentir ahora más que nunca, en nuestras Indústrias Nacionales.
Fabricantes de Productos de Hormigón en todas partes de las Americas han mostrado su capacidad en satisfacer las emergencias causadas para la defensa de nuestras Americas Unidas.
Milliones y Milliones de Bloques de Hormigón para nuevas fábricas y hogares en servicio de la Defensa de las Americas.
BESSER MANUFACTURING CO.
Alpena Michigan
Estados Unidos de Norte América
PLANTAS COMPLETAS PARA FABRICAR BLOQUES DE HORMIGON

Close-up of Henry Grady housing job in Atlanta, Ga., which involved the use of 350,000 lightweight concrete masonry units

also sold through the architects. Mr. Bailey makes it a practice to drop in on any of the important architects whenever he is in the vicinity of their offices whether there is prospective business or not.

"Dixie Construction Reports," and other sources of information on building to be done, are followed up without fail. Every individual home prospect is called on. Another practice of Mr. Bailey's is to stop and see the contractor, if he passes a house or other building under construction. Often, the house under construction is only one of several or many the contractor is planning to build. Although this one house may be of competitive materials, it does not mean the contractor might not be converted for the others to follow.

In Atlanta, service is an important part of a concrete products business. The Concrete Manufacturing Co. often finds it necessary to service small jobs from the beginning right up to completion of the job. This would include estimating a job, after a prospect has been found, designing the job and even getting a mason to lay the block. Mr. Bailey is, of course, interested in seeing that a wall is properly laid up and he visits the various projects under construction to give advice, when necessary, and to check on workmanship.

On small jobs, if the estimate exceeds the required number of units, the extras are picked up in company trucks, when convenient, and the customer is given full price for the units. This practice is a gesture of good will.

An advantage in competing against clay tile is that specials to see the job through, 100 percent of concrete masonry, are always kept available in stock. Clay products are used extensively in partitions and backup work but Mr. Bailey has largely confined his attention to exposed interior and exterior work where he has the opportunity to sell on appearance. The inside finished surface available in basement walls of concrete masonry is the main talking point against granite stone competition.

Another important sales argument is his large stock of fully cured units, the 8- x 8- x 16-in., and all the fractions and specials required. Stock on hand runs around 150,000, part of which is kept under covered storage to enable trucks to load during bad weather. Should a fairly large order develop on short notice, he is not likely to lose it because of lack of stock on hand. Everything is followed up by personal call, and each job when finished is counted up to help sell others.

Selling the Farmer

Activities of the Concrete Manufacturing Co. cover a radius of 100 miles and, on occasion, farther for some large projects. Farm buildings are another outlet being developed for concrete masonry. It has been found that good jobs, sold close in to Atlanta by personal call, arouse the interest of farmers farther out and, as a result, this radius of activity is being widened out.

Most of their orders are for small amounts. Long hauls are made in semi-trailers by contract, in preference to rail haul because breakage in transit is much less. Portland Cement Association literature on concrete masonry is utilized in towns outside Atlanta to take the place of personal solicitation. Compressive tests and certification of units are used only when requested, but the units are manufactured to consistently surpass the federal and city requirements for 700 p.s.i. and 800 p.s.i. gross area, respectively.

Roy W. Darden joined Mr. Bailey in 1938 to take over supervision of the plant, thereby enabling him to devote his full time to promotion and sales. Mr. Darden, who formerly was associated with Brooks-Calloway Construction Co., now spends most of his time on sales work and M. E. Posey, is foreman of the plant.

Part of the 150,000 concrete masonry units kept in stock. Plant is shown in the background

Modernizing Housing In Latin America

Modernización de los hogares Latinoamericanos

By GEORGE W. HOFFMANN

Geo. W. Hoffmann

El gran éxito de la conferencia de ministros extranjeros de todas las repúblicas americanas, celebrada recientemente en Río de Janeiro, es una prueba inequívoca del deseo de la América Latina de obtener la independencia económica, la cual sólo puede lograrse mediante la amistad y la cooperación de la hermana república, los Estados Unidos de América.

La República del Brasil ha iniciado los planes que se espera induzcan a las otras repúblicas hermanas a liberarse del dominio económico europeo, mediante la creación de industrias nacionales y el mejoramiento de las normas de vida, lo que, después de todo, es la fuerza preponderante que dirige el engranaje económico-social de las naciones.

La República Argentina fué la única nación que no se sometió por completo al programa de solaridad de todas las Américas. Esta nación aun mantiene la creencia tradicional de siglos pasados, convencida de que su independencia económica debe permanecer ligada al Viejo Mundo.

El Brasil presenta un contraste distinto de la Argentina respecto a su perspectiva sobre el futuro. Bajo la sabia dirección del Presidente Getulio Vargas, el Brasil ha sido transformado de una dinastía feudal de barones de café y carnes a una dirigente fuerza industrial en la América del Sur, habiendo mejorado también notablemente el orden social del país.

Un asunto de especial interés al fabricante de productos de hormigón, es el programa de modernización de las casas económicas y sanitarias para obreros, bajo los auspicios de las "Aposentadurías" o Cajas de Seguro y Asistencial Social, cuyas actividades se extienden de las selvas del Amazonas a las fértiles praderas de los Cerros de Río Grande.

Lo más notable de estas "Aposentadurías" es el "Instituto de Aponsentaduría e Pensoes dos Industriales", fundado el mes de enero de 1938 por el Departamento de Obras Públicas, bajo el gobierno del Presidente Vargas. El Dr. Plinio Cantanhede, presidente del Instituto, es un ingeniero civil e industrial quien por muchos años tuvo

An outstanding accomplishment of the recent conference of foreign ministers of all American Republics held in Rio de Janeiro is the unmistakable proof of the desire for economic independence in Latin America which can only be accomplished with the friendship and cooperation of their "great brother" state to the North, our own United States.

Brazil initiated plans which are expected to lead the Latin American Nations in their liberation from European economic domination through national industries and the raising of its country's living standard, which after all is the fundamental power that drives the gears of social and economic life in every country.

Argentina was the only country which did not commit itself to the entire program of inter-hemisphere solidarity of all of the Americas. This country still holds to the traditional belief of the past centuries, convinced that its economic dependence should remain tied to the Old World.

Brazil presents a distinct contrast to Argentina's outlook on the future. Under the able guidance of President Getulio Vargas, Brazil has changed from a feudalistic dynasty of coffee and beef barons to become today the leading industrial power in South America. It also has made some real accomplishments in social advances.

Of particular interest to the concrete products manufacturer is the modern housing program of the "Aposentadurias" (Social Security and Pension Organizations), whose activities cover the country from the jungles of the Amazon to the fertile grazing lands of the Cerras of Rio Grande.

The most outstanding of these Aposentadurias is the "Instituto de Aposentaduria e Pensoes dos Industriales," founded in January, 1938, by the Public Works Department of the Vargas government. Dr. Plinio Cantanhede, engineer and president of the Institute, is a civil and industrial engineer who for many years was professor at the National Brazilian Engineering Academy and is today just 31 years old. He personally directs every move of the Institute, and has been the prime mover in the building of a model city on former wastelands at Realengo, re-

Left: Modern concrete block plant at Realengo, Brazil. Right: Housing project under construction, showing details of masonry

un cátedra en la Academia Nacional de Ingenieros del Brasil, y tiene solo 31 años.

El Dr. Cantanhede dirige personalmente todas las actividades del Instituto y fué el iniciador y patrocinador de la construcción de la Ciudad Modelo en Realango, en cuyo lugar se construyeron casas para 5000 familias de obreros industriales de Río de Janeiro. Este es el proyecto de construcción de casas hechas de bloques de hormigón al cual nos referimos en la edición noviembre de 1941 de la Revista ROCK PRODUCTS.

El financiamiento de este proyecto lo efectuó el Instituto. Los fondos disponibles para la construcción de casas, pensiones, etc., provienen de la contribuciones de los obreros, de los patronos y del Gobierno brasileño.

Se cuenta con cinco proyectos para la construcción de Ciudades Modelo: el de Realango, ya mencionado, en donde el año pasado se construyeron 1200 casas de dos apartamentos, las cuales fueron inauguradas por el Presidente Vargas; el de San Andrés, Estado de Sao Paulo, donde se están construyendo 5000 casas; el de Florianópolis, Estado de Santa Catarina, donde ya se han terminado y ocupado 2000 casas, y el de Victoria, Estado de Espíritu Santo, donde se espera construir 200 más.

Además de estos proyectos, se está estudiando la construcción de seis hoteles y casas de cuatro a dieciseis pisos, algunos ya en vía de ejecución. Todos los trabajos de arquitectura han sido hechos por el Departamento de Ingeniería del Instituto IAPI. Las obras de construcción serán efectuadas bajo la dirección del Instituto IAPI, por contratistas de la localidad. La construcción será de bloques de hormigón. Debido a la escasez de cemento, en una obra de Sao Paulo hubo que substituir los bloques de hormigón con ladrillos comunes.

Para suplir la demanda de bloques de hormigón exigida por las especificaciones del proyecto de Realango, en 1940 se instaló una máquina Super-Tamper de Besser para hacer los bloques de hormigón, la cual ha estado funcionando 23 horas al día, siete días por semana y sólo la escasez de cemento obligó a reducir la producción de bloques de hormigón para esta obra.

Estas obras son sin duda alguna las más notables e interesantes de todas debido principalmente al interés personal del Dr. Cantanhede en el desarrollo de las obras, así como también a la cooperación del Dr. Lafayette Herminio de Freitas, jefe-ingeniero de la máquina de hacer bloques de hormigón y el Dr. Sidney de Barros Barreto.

En Realango las casas se construyeron en serie. Una cuadrilla de obreros especialmente preparada, hacia las zanjas a la par que los albañiles construían los cimientos, los cuales consistían de bloques de hormigón de 20 cm. de ancho, 20 cm. de alto y 40 cm. de largo. Después esta cuadrilla de obreros empezó a hacer las zanjas a ocho metros más arriba de la calle proyectada.

Una vez que esta cuadrilla hubo abierto las zanjas para los cimientos de la décima casa, los puntales del techo eran colocados por carpinteros especializados. Luego seguían los albañiles colocando los bloques de hormigón de 20x20x40 cm. sobre los cimientos. Se necesitaron cuatro albañiles y tres peones, trabajando 48 horas, y colocando 1600 bloques de hormigón de diferentes tamaños, para acabar una casa de familia de dos apartamentos.

Todos los bloques de hormigón fueron hechos de una mezcla de 1:10, es decir, una parte de cemento portland y 10 partes de agregados: 40% agregado grueso (grava) y 60% de arena limpia. El costo de cada bloque de hormigón fué de cinco centavos americanos. Cada apartamento consiste de cinco habitaciones y una galería en el frente y otra detrás, esta última para lavar la ropa. El área del jardín detrás de la casa es tres veces mayor que el área de la casa. El costo de la casa fué de 525 dólares. El alquiler de cada casa es de 3 dólares al mes y éste sirve para amortizar el capital invertido por el Instituto, el que hace propietario de la casa al ocupante después de veinte años, o cuando el obrero se halle permanentemente incapacitado para trabajar.

Modernizing Housing In Latin America

(Continued from page 77)

housing 5000 families of Rio de Janeiro industrial workers. This is the concrete block housing project referred to in the November, 1941, issue of ROCK PRODUCTS.

All the financing of these housing projects is handled through the Institute. Funds are made available for housing, pensions, and other social activities through contributions from the income of the worker, a similar percentage from the employer, and the government contributes an amount equal to that of the workers.

There are now five housing projects under way: Realengo, State of Rio de Janeiro, 2500 two-family houses of which 1400 were inaugurated for occupancy by President Vargas in November, 1941; Sant André, State of Sao Paulo, 2000 houses of which 300 have been completed; Osasco, State of Sao Paulo, where 5000 houses will be built; Florianopolis, State of Santa Catarina where 200 houses have been completed and occupied; and Victoria, State of Espirito Santo where 100 houses are being built.

In addition to these housing projects, six major hotel and apartment houses are under consideration. They will be from four to 16 stories in height, completely designed by the Institute's engineering division and erected by local contractors, using a reinforced concrete frame and concrete block walls. Lack of cement has made it necessary to substitute clay brick on some of the projects although the buildings were designed for concrete block.

To meet this demand for concrete block, a plant in Rio employing Besser Super-Tamper equipment has been operating day and night for years. Only the lack of cement has prevented continuous operation today.

Realengo is undoubtedly the most efficient and interesting housing project of them all. This efficiency is the result of the personal interest of President Cantanhede of the Institute, his first engineer, Dr. Lafayette Herminio de Freitas, and his aide, Dr. Sydney de Barros Barreto who is in charge of the concrete block plant.

At Realengo the buildings are erected in series. Specially trained crews are breaking ground in one field, and while masons are setting the first row of 12-in. foundation blocks the ground breaking crew has moved on 25-ft. to start the next excavation. When this crew has broken ground for the tenth building, the roofing rafters are being set in place on the first structure of the row. Actual masonry work above the foundation is executed by a group of four blocklayers and three assistants who are working 48 hours setting 1600 block of various sizes to complete the walls of one two-family house.

Standard 8- x 8- x 16-in. (20- x 20- x 40-cm.) concrete block made of a 1 to 10 sand-and-gravel mix, cost 5½ cents, U. S. currency, per unit. Each house is approximately 22- x 22-ft. in overall dimensions with a porch in front and a veranda at the rear, but there are no basements. The house, containing five rooms, costs about $525 in U. S. currency. Only $3.00 per month payments are required which include amortization, making the tenant owner of the house in 20 years.

With such outstanding examples, concrete block construction is gaining rapidly in popularity all over South America.

JAEGER Motorized CONCRETE PLANTS MEET YOUR PROBLEMS

LABOR SCARCITY IN DESERT — 8 "HIGH DUMP" 4 Yd. Units Averaged Over 120 Cu. Yds. Hourly of Minus 1" Slump Mix on California Bomber Range.

Most of the **TRUCK MIXERS** *now speeding war work are* **JAEGER**

HIGH PRODUCTION: 95,000 Yds. for Ford Bomber Plant @ 2000 Yds. per 16 Hours—with 10 Jaeger "LOW CHARGE" 4 Yd. Units.

PLACING PROBLEMS: 40 Mobile 3 Yd. Jaegers Poured 1200 Igloos at Anniston, Ala.

CONTINUOUS POURS: 2065 Yds. in 31 Hours at Seattle Army Warehouse with Mixed Fleet of Ten 4 Yd. Units as Shown Here.

YOU OWE IT TO YOURSELF TO KNOW why more concrete is being mixed and placed by Jaeger Truck Mixers, Agitators than by any other method — why Jaegers produce higher strength, more workable concrete and bigger daily yardage, at lowest operating and maintenance cost. SEND FOR COMPLETE CATALOG AND DATA — TODAY!

• Only JAEGER Offers a Type for Every Need

"HIGH DUMP": Top-Loading, with Fast, Vacuum-Controlled Discharge Door, or Combination Top-or-End Loading—to meet conditions. 2 to 5 yd. sizes.

OR "LOW CHARGE": Fastest on market. 2 to 8 yd. sizes. All Jaegers have 2-Speed Transmission (Vacuum-Controlled Truck Engine or Separate Engine Drive), One-Shot Loading, Dual-Mix Drum, Fastest Discharge.

THE JAEGER MACHINE CO.
503 DUBLIN AVE., COLUMBUS, OHIO
World's Largest Manufacturer of Concrete Mixing Equipment — Pumps, Hoists, Concrete and Bituminous Paving Equipment.

Four 2 Yd. Units did 198 yds. in a day with this setup at Linthicum, N. C.

Add Fine Aggregate To Improve Mix

Eau Claire Sand and Gravel Co. prints chart giving prices of various mixes recommended for different conditions

Truck driveway of ready mixed concrete plant is depressed to save overall height in filling bins with crane

To the Eau Claire Sand and Gravel Co., ready-mixed concrete has proved to be the means of selling more sand and gravel through service. The product isn't new in Eau Claire but had not been produced previously by methods of control which had state and federal approval. This is the first plant in the city to proportion materials by weight.

The plant has a capacity in steel bins of 450 tons of aggregate and 52 tons of cement in bulk. It is entirely enclosed and insulated with a 1-in. thickness of insulating board and felt, since temperatures of 25 deg. below zero are common in Eau Claire.

Partitioned aggregate bins are served by a hand-operated 2-cu. yd. Butler travel batcher, or lorry, which, when the materials are weighed, is moved over a discharge spout under a Butler cement batcher. This batcher is stationary under the cement bin. A truck makes only one stop. Water is weighed in a separate Butler scale. Steam through jets is introduced into the bottoms of all the aggregates bins and mixing water is heated during freezing weather.

The truck driveway is depressed to save overall height for filling the bins by locomotive crane. In cold weather slide gates on top of the bins are opened and closed by cables from the ground when filling bins. Cement is taken from bulk box cars through a screw conveyor and enclosed bucket elevator into the bin.

To compensate for the deficiency in fines there is added about 11 percent 40-mesh to 150-mesh sand which is a by-product of the dry sand plant screens. This is weighed out from a separate bin into the aggregates batcher. In other words the dry sand plant is the means of putting back into the mix fines which ordinarily are too difficult to retain in the ordinary wet classification of sand. Addition of the fines increases the density and workability of the concrete.

Delivery equipment consists of seven 2-cu. yd. Rex transit mixers, one 1½-cu. yd. Blaw-Knox and one 1½-cu. yd. Jaeger mounted on truck chassis of several makes. Some thought is being given to insulating the mixer drums.

For serving small jobs where wheelbarrows, etc., must be used, the company has built a portable ramp and hopper which is stationed at the job. The truck backs up the ramp and dumps into the hopper, thereby releasing the truck with very little standby time.

A standard price list form developed from technical publications of the Portland Cement Association has been printed in chart form, recommending accepted practices in purchasing concrete for all conditions. These are based on loads of not less than 2 cu. yd. delivered in Eau

(Continued on page 82)

Left: Operator batching cement. To the rear is the water scale. Right: Discharge spout under cement batcher for filling truck mixers

From Beer to Concrete

Erect batching equipment inside former bottling plant of brewery. Also make concrete products

Bob Posey, secretary and manager of the Henderson Concrete Co.

COLD WEATHER and rain do not hinder operations at the new ready-mixed concrete batching plant of the Henderson Concrete Co., Inc., Henderson, Ky., because the company took advantage of an available empty industrial building as a site. The former bottling plant of the Henderson Brewery Co. was purchased, and the concrete plant was built into it.

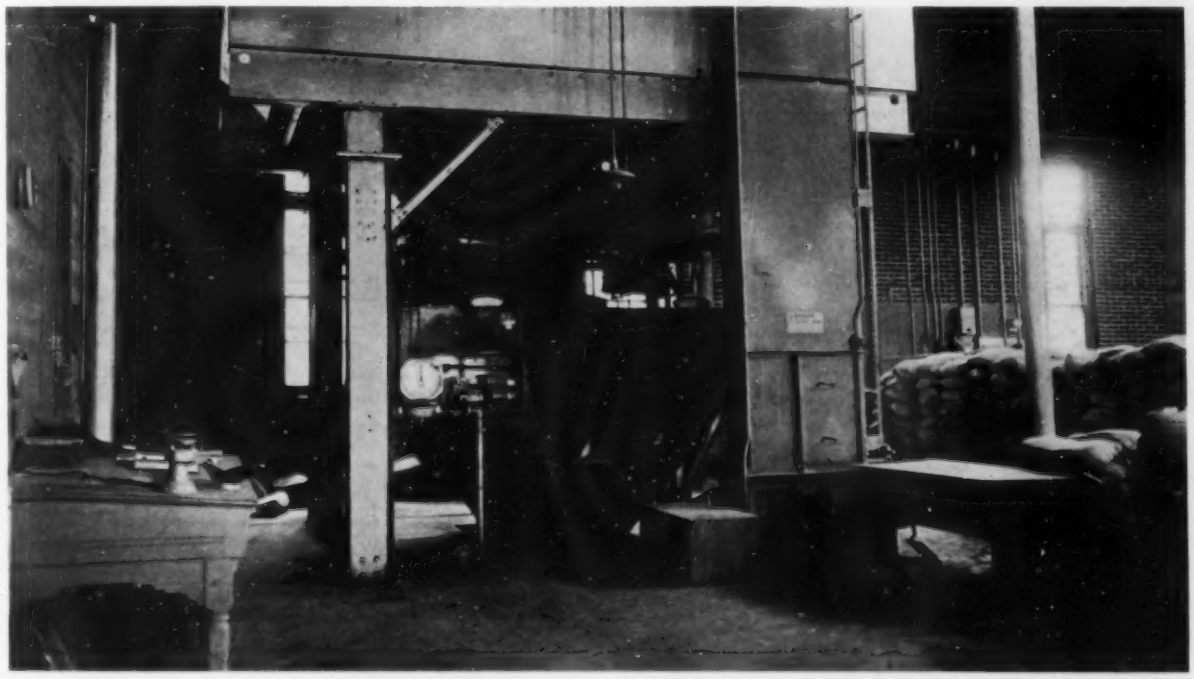
Semi-Bulk Batching Plant

The brick veneer building, 60- x 100-ft., has heavy 6-in. reinforced concrete floors on two levels, the lower floor being 5-ft. below ground level. Batching bins and equipment are inside the top floor, with the bin extending through the roof and the batcher extending through the floor to discharge into truck mixers below. An opening was knocked through the wall on one side of the building, and a ramp built to allow the truck mixers to back in from the outside.

Concrete is batched out from a C. S. Johnson steel, semi-bulk cement batching plant which has the bin built up to hold 75 tons each of sand and gravel in two compartments. Aggregates are trucked from the Bedford-Nugent Co. sand and gravel plant, not more than a city block away, to a ramp alongside the building, where the hopper feeds out by gravity into the boot of a bucket elevator that fills the bins at the rate of 150 tons per hour. A semi-bulk batching plant was selected in place of a bulk plant because of the shortage of bulk cement cars. A rail siding alongside the bottling plant was one of the reasons for selection of the site, but the trackage was removed and cement in sacks is trucked to the plant. Seven or eight carloads can be stocked on the batching floor.

The semi-bulk feature of the plant consists of a separate cement storage compartment—a 4-ft. diameter cylinder—extending up into the main aggregate bin. Cement from sacks is dumped into an open top screw conveyor which feeds into an enclosed bucket elevator that fills the cement compartment at the rate of 150 bbl. per hour. Capacity of 40 bbl. in the cement compartment provides a surge reserve to keep operations going without delay in the same way that a bulk plant would operate. Mixing water is weighed by a Neptune continuous flow water meter.

Weighing is done by a 2-beam scale,



Showing batching equipment with screw feeder for the cement, to the right, testing apparatus and records on table, to the left

Ready mixed concrete plant erected with'n a former bottling plant of brewery. Aggregates ramp and elevator on the left

one for cement and one for aggregates; and the water, cement and aggregates discharge simultaneously into the mixer drums below. This method of discharge helps to shrink the concrete as it flows into the mixers. Compressed air is introduced into the cement compartment to keep it flowing into the batcher. Mixes are computed in advance by weights for every strength specification and slump requirement.

Aggregate bins for the sand and the gravel are equipped with heating coils for winter operation and a removable roof has been built over the top of the bins. A 25-hp. stoker-fired tubeless steam boiler develops steam to heat the aggregates and the mixing water, Mixing water is heated by coils in a 3000-gal. storage tank made from the old brewery vats. An automatic cut-off valve kicks out the boiler when the water reaches a temperature of 180 deg. F. Heated offices adjoin the batching floor.

Deliveries are normally made in three 2-cu. yd. Blaw-Knox truck-mixers on Autocar chassis, with additional delivery equipment rented when needed from the Concrete Supply Co. across the Ohio river in Evansville, Ind. Since the plant went into operation, in June, 1941, most of the concrete has gone into defense construction work.

Everything about the plant is convenient. The plant operator could batch out concrete without hardly getting his clothes dirty. Moisture-determination scales and other control equipment are available to him, where he can walk around and work without restriction.

On the lower level, the trucks have all the conveniences of a commercial garage even to a repair shop. Sills and lintels were precast on this level for a large defense plant project. The company also is a building supply dealer, in the handling and sale of concrete products manufactured in Evansville.

Robert Posey, manager of the company operations, is secretary of the company. Edw. N. Frisse is president; John Rudolph, treasurer; and Joe Traub, vice-president. John Crisp, plant engineer, designed the plant.

Add Fines to Mix

(Continued on page 80)

Claire or within six miles of the plant by highway. Prices are scaled on a strength-workability basis with a range of 1500 p.s.i. to 5000 p.s.i. compressive strength; dry, medium and wet slump; and for various combinations of aggregate sizes. An additional charge of 50c is added for loads less than mixer capacity.

This form also has tabulated strength requirements recommended for all types of concreting whether exposed to weather or protected from cold weather. Officers of the company are A. O. Ayres, president and general manager; G. A. Rutherford, vice-president; E. G. Hoeppner, secretary-treasurer; and C. H. Kittilstadt, general superintendent.

Start Block Plant

THE CAROLINA CINDER BLOCK CO., Durham, N. C., has commenced operation of its new plant, according to George D. Owen, head of the company. Capacity of the plant will be in excess of 1000 block per day. Mr. Owen was formerly located at Brookhead, Va., where he was engaged in the cinder block business.

Start Work On Pipe Unit

KENTUCKY CONCRETE PIPE CO. has started construction of a factory in Henderson, Ky. The building will be 70- x 210-ft., and about 100 men will be employed, according to C. G. Woody, local manager.

The "Quinn Standard"

FOR CONCRETE PIPE

The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 30 years service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that **Quinn pipe forms** and **Quinn mixing formulas** combine to produce the finest concrete pipe at lowest cost.

Quinn Heavy Duty Pipe Forms

Hand or wet process. Built to give more years of service—sizes for any diameter pipe from 12 to 84 inches—tongue and groove or bell end pipe—any length.

Quinn Medium Duty Pipe Forms

For making pipe 12 to 60 inches in diameter—any length.

WRITE TODAY

Complete information, prices and estimates sent on request.

QUINN WIRE & IRON WORKS 1603 12th ST. BOONE, IA.

CONCRETE PRODUCTS

Consultation Service

In these pages, month after month, is published the most helpful information obtainable about the manufacture and sale of all kinds of concrete products. If you need further details about any of this material or about concrete products equipment our staff of engineer-editors will be glad to serve you. Producers everywhere are taking advantage of this extra service. Write us about your problems.

ROCK PRODUCTS

309 West Jackson Blvd. Chicago, Ill.

1-2-3 and now 4

Hudson Supply & Equipment Co., Washington, D. C., as the plant looked in March before its fourth Joltcrete was installed.

STEARNS JOLTCRETES!

"We bought our first Joltcrete machine in 1939, and it's running as smoothly today as the day it was installed. The high quality of Joltcrete vibrated blocks promptly created a market for the product. The initial investment in equipment was comparatively low, production was high, maintenance costs were low, operation was continuous because of the machine's stamina and simplicity, so as demand for the product grew we naturally added new Joltcrete machines. That's why we have just installed our fourth." Supt. J. A. Finfrock, Hudson Supply & Equipment Co.

As in the case of the Hudson installation, Stearns Joltcrete machines all over the country are turning out superior wall units for the economical construction of buildings and works necessary to the prosecution of the national war effort.

Write for complete information on Joltcrete Block Machines.

STEARNS MANUFACTURING CO. - ADRIAN, MICH.

GENE OLDEN, PRESIDENT

Manufacturers of Complete Concrete Products Plant Equipment.

Ready Mix Producers Go to School

By CHAS. CLARK*

THE SECOND SHORT COURSE in Ready Mixed Concrete was held at Ohio State University, Columbus, Ohio, March 24 and 25. This course was under the direction of Prof. George E. Large of the Department of Civil Engineering and the Engineering Experiment Station, with the Ohio Ready Mixed Concrete Association as co-sponsors.

With Prof. George E. Large presiding, the opening session, included the address of welcome by W. D. Turnbull, junior dean, College of Engineering, and with response by A. W. Kimmel of the Ready Mixed Concrete Corp. of Dayton, who is vice-president of the Ohio Ready Mixed Concrete Association. This was followed by a discussion of the topic, "Factors Affecting Uniformity of Ready Mixed Concrete," by Stanton Walker, director of engineering, National Ready Mixed Concrete Association.

At the afternoon session, March 24, Chas. W. Allen, acting chief engineer, State Highway Testing Laboratory, presided. E. W. Cummins, Engineer of the State Highway Testing Laboratory discussed the various concrete mixes including demonstrations of concrete mix design. Mr. Cummins' demonstrations were practical and brought forth considerable open discussion.

Prof. Geo. E. Large discussed the various "Methods of Determining Moisture Content of Aggregates and Concrete." At 4:00 p.m. on Tuesday, Elmer C. Henlein, priorities district manager, The Bureau of Field Operations, War Production Board, Cincinnati, Ohio, discussed and answered questions on priorities as affecting Ready Mixed Concrete Producers.

On Tuesday evening, a banquet was held in the Deshler-Wallick Hotel under the auspices of the Ohio Ready Mixed Concrete Association, with more than 100 persons present. Stephen Stepanian, treasurer of the Ohio Ready Mixed Concrete Association was toastmaster. Speakers of the evening included Murray D. Shaffer, chief engineer, Bureau of Location, Right of Way, Ohio Department of Highways, and Major Norman A. Imrie, Safety Editor, Ohio Department of Highways, whose topic was "Highways for Victory."

Prof. J. R. Shank, assistant director, Engineering Experiment Station, Ohio State University, presided at the Wednesday morning, March 25 session. The first speaker was J. T. Long, Jr., chemist, State Highway Testing Laboratory, who talked on "A Rapid Method of Determining the Disintegration of Concrete by Means of Audio Vibrations." This topic was discussed by Mr. McCann, research physicist, Engineering Experiment Station. The demonstration of the various equipment made the topic a most interesting one.

Stanton Walker discussed the durability of concrete as affected by aggregate (with the use of slides). Mr. Walker's talk was followed by a talk on "Ready Mixed Concrete for Architectural Construction" by M. H. Walters, structural representative, Portland Cement Association. Following each of the talks, an opportunity was given for general discussion.

The afternoon session was given over to open forum discussion with Stephen Stepanian presiding. Mr. Stepanian had requested the engineers to assemble in one section of the auditorium and those interested in the production of ready mixed concrete in another, with allied interests including cement salesmen in the third section. This gave the Chairman an opportunity of calling

JOHNSON
or 20 years, in
ANT DESIGN
MAXIMUM SAVINGS IN TIME, LABOR, AND MATERIAL go with operation of a JOHNSON CENTRAL MIX PLANT. ONE MAN OPERATION AND FASTER BATCHING TIME—assure positive operating economy.
CONCENTRIC AGGREGATE CEMENT BATCHING—aggregate and cement intermingling, during discharge operation, assure 20% pre-mixing and pre-shrinkage—eliminates mixer gumming.
CEMENT STORAGE IN CENTER OF AGGREGATE BIN—affords centralized control operation and greater accuracy. Cement scale and hopper is suspended within aggregate scale and hopper.
STEP BY STEP CONSTRUCTION—small, portable plants, for use with bag cement, are so designed that capacity may later be increased and bulk cement installed without costly change or delay.
BUILT FOR ANY TYPE BIN CHARGING METHOD—
MANUAL-SEMI-AUTOMATIC OR FULL AUTOMATIC CONTROL IS AVAILABLE ON ALL JOHNSON CENTRAL MIX PLANTS.
BINS · BATCHERS · SCALES · BULK CEMENT EQUIPMENT · CENTRAL MIX PLANTS · CONCRETE BUCKETS
C.S. JOHNSON CO.
CHAMPAIGN, ILLINOIS
ELEVATORS · CONVEYORS ROADBUILDER'S EQUIPMENT SILOS AND STORAGE BINS

on different ones for varied interpretations of the topics under discussion. The open forum discussion as usual provided one of the high spots in the short course.

* Secretary, Ohio Ready Mixed Concrete Association.

Cement Is and Will Be In Much Demand

OPERATIONS of Alpha Portland Cement Co., Easton, Penn., so far this year have been at approximately 70 percent of capacity, which is higher than the comparable period of 1941, F. G. McKelvy, president, stated at the company's annual meeting. He said that the months covered are normally a period when cement usage is limited.

A large portion of the company's output is going into government construction projects and the backlog of orders on hand are above a year ago, the president said.

Concerning conditions that might develop in a post-war period, it was the opinion of the company's president that the cement industry probably would be in a better position than other manufacturers who are classed in the heavy industry field. He based this premise on the possibilities of a post-war housing program, road construction, rehabilitation of plants, and possible new technical uses for cement. In this connection Mr. McKelvy referred to the punishment present roads may have to stand through the movement of trucks carrying materials for the war effort and for the armed forces.

Further, manufacturing plants are being subjected to considerable wear and tear and later may need rehabilitation. He also visualized a large demand for automobiles after the war is over as a result of the sharp curtailment in their manufacture now for civilian buyers. And, he said, this would mean the need for better roads. New home building also has been sharply curtailed, he pointed out, and in a post-war period, pent-up demand here might have an influence in new construction and on the use of cement.

Defense Type Concrete House at Cleveland

GEIST COAL & SUPPLY CO., Cleveland, Ohio, participated in the recent Home and Flower Show held at the Public Hall in Cleveland, furnishing the concrete masonry units for the full size house built and designed by Cuyahoga Realty, Inc.

This house (illustrated on the cover of this section of ROCK PRODUCTS) created a great deal of interest not only because of its attractive design but also its very low cost to fit in the defense housing program. Consisting of four rooms with bath, including basement, furnace, stationary tubs, standard kitchen and bath equipment, the house was designed to sell for about $4350, based on Cleveland prices.

Masonry units were lightweight, made with portland cement with Haydite aggregate. Units were the standard 8- x 8- x 16-in. size scored to give an ashlar effect, and they were made on a Besser Vibrapac machine. The Geist plant has a capacity of 10,000 units per day.

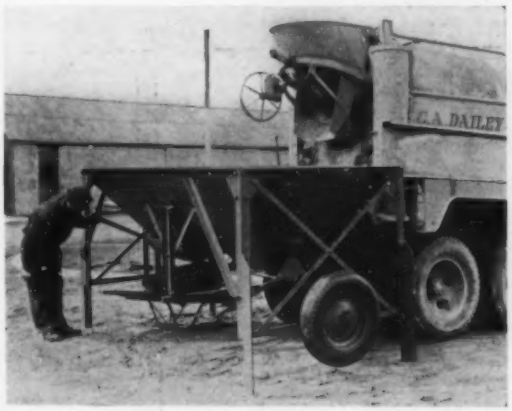
Officers of the company are Herbert Geist, founder and president and general manager of the company; and three sons and a daughter, I. C. Geist, vice-president; E. K. Geist, superintendent; and Mrs. W. R. Stuart, office manager. The company has been in the coal and building supply business for 40 years.

Expand Operations

MEADVILLE SUPPLY CO., Meadville, Penn., has purchased 16 acres of land on which has been opened a sand and gravel pit. Material will be hauled to its present washing and screening plant in Meadville for processing.

ANNOUNCING—

THE NEW



BUTLER PORTABLE CONCRETE HOPPER

Try THIS With Your Truckmixer

More Loads per Day for your truckmixers. Save up to ½ hour per trip.

Haul to Job behind light car or first truckmixer. Adjustable drawbar fits any vehicle.

Two-Wheel Design is more stable than three-wheel type, more maneuverable than any. Tires are standard, more easily obtained.

One-Man Erection with one lift of an automobile jack.

Capacities range from two yards to five yards.

WRITE FOR LITERATURE TODAY

BUTLER BIN COMPANY

WAUKESHA WISCONSIN

Applying Portland Cement Paint

AN INTERESTING DISCUSSION of painting methods was presented by Paul Woodworth of P.C.A. followed by a practical demonstration on concrete masonry wall sections at the two regional meetings held recently in Atlanta, Ga., and Kansas City, Mo.

In introducing the subject, Mr. Woodworth said that the discussion would be limited to the characteristics of portland cement base paints although he did not want to imply that other paints such as oil and synthetic resin base paints cannot and are not being used satisfactorily. He said that this limitation was taken because of longer service record, the background, research data available for study, and the present proportion of painted wall market using portland cement paint. There is also, he said, a standard specification covering the composition of portland cement base paints. Mr. Woodworth said the area of painted concrete masonry walls built in 1941 was 10 times that built in 1938. The service record of these paints has been good, and Mr. Woodworth expressed the view that the painted concrete masonry wall offers market possibilities to products manufacturers.

Failures of portland cement paint jobs are rare, he said, if the paint has been properly applied. Properly applied portland cement paint to exterior wall surfaces may be expected to have a service life of six to eight years. Some paints last for a considerably longer period and some are less durable. The less durable jobs, said Mr. Woodworth, are frequently those wherein the paint is brushed out in too thick a film or the preparation of the base is neglected and no effort is made to cure the wall.

Turning to the causes for paint failures, Mr. Woodworth said that the presence of excess or free water on the surface being painted or the use of too much water repellent in the paint may cause the unusual cases of blistering. Poor opacity and color value may be due to some deficiency in the paint composition, to the use of too much water in the paint mix, to applying the paint too thin or to the continued presence of excessive moisture behind the film. Fine crazing observed in paint films is logically related to the shrinkage, tensile strength, extensibility and other physical properties of the film which in turn vary with the composition of the paint. Serious crazing, involving fractures extending through the paint film and more than 0.002 in. wide, usually is related to the development of crazing of the concrete unit subsequent to painting.

Mr. Woodworth mentioned that the Federal Specifications Board has just issued a Federal Master Specification No. TT-P-21 for portland cement paints which calls for two types of paints; type (1) with a minimum portland cement content of 65 percent and a maximum hydrated lime content of 25 percent; type (2) has a minimum portland cement content of 80 percent and a maximum of hydrated lime of 10 percent. Other ingredients are held to close limits, such as water repellents, hydroscopic salts and opacifying agents. The Specification also provides for a second class of paints other than the powder described. Fine white silica sand may be added to the paint powder, and it provides for additions of from 25 to 65 percent by weight of the paint

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Seven Reasons Why It Will Pay You To SPECIFY JACKSON:

1. No pallets
2. Higher Strength brick
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5. Table Pocket Liners
6. Sharp Edge Bricks
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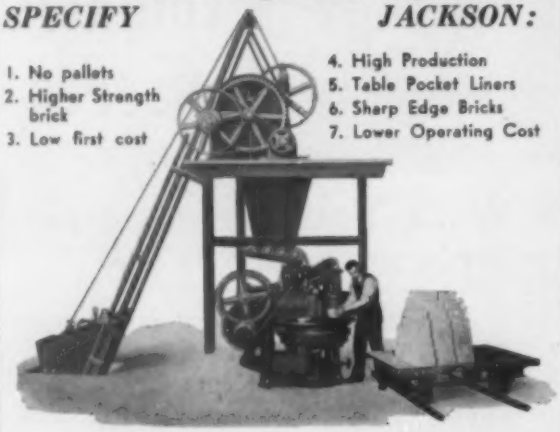


No other Brick Machine can give you all these advantages. The JACKSON Model A produces up to 28,000 brick per day . . . the Model C up to 14,000 brick per day. Check up on this *low-cost* profit-making machine *now*. *WRITE FOR BULLETIN J-42 TODAY.*

JACKSON & CHURCH COMPANY
SAGINAW, MICHIGAN, U.S.A.

"Here's A Hot One"

No one ever bought Commercial Pallets the second time—unless he had orders for more blocks than he could handle on the Commercial Pallets he already was using. The reason they do not buy them the second time is because they do not need to. The original purchase of steel, Close-Clearance Pallets lasts a life-time. You do not lose them by breakage, bending, cracking, warping, or any of the many other things that happen to wood, cast-iron or malleable pallets; and besides that they are all cored, easy to handle and light in weight.

Buy and be convinced of these facts

The COMMERCIAL SHEARING & STAMPING COMPANY
YOUNGSTOWN, OHIO.

powder. This second class of paint is desirable where coarse, open, rough texture units are to be painted.

Proper procedure for a good painting job were outlined by Mr. Woodworth. It is good practice, he said, to defer painting the walls until they are at least 28 days old. Thorough wetting of the wall to control suction and to provide a moisture reserve for a curing agent is necessary before painting. A garden hose with a fine spray is excellent for this purpose, but the use of a brush is undesirable. Walls may be wet in one operation not more than one hour before painting. The spray should be handled so that each section of the wall is sprayed three or four times for 5 to 10 seconds depending upon the rate of absorption of the surface. About two to five minutes should be allowed between these applications. In extremely hot weather the surface should be rewet just prior to painting.

Cement paint powder should be mixed with water to the consistency of thick whipping cream, but with extremely porous textured units it may be desirable to use a slightly thinner consistency for the first coat. From 65 to 85 percent by weight of water to the dry powder is required to give a proper consistency with commercial paints; job mixed paints from 55 to 75 percent; and for paints with white silica sand, 40 to 60 percent. The cement paint powder should be first mixed with about one-half the amount of water required for the proper consistency. Mixed paint will remain in a usable condition from three to four hours, except in very hot weather.

Paint should be applied in two coats of the same color, and not less than 24 hours should be allowed between successive coats. An ordinary scrub brush or fender brush with short stiff fibre bristles should be used in applying the paint. It should not be applied in temperatures below 40 deg. F., and preferably should not be applied with the direct sun striking it. About 45 to 55 sq. ft. per gal. coverage can be expected for a two-coat job. As soon as the paint film has hardened sufficiently (8 to 12 hr.) so that it will not be damaged by a fine spray, the walls should be moistened and kept moist until the application of the second coat, by spraying two or three times a day.

Concrete for Steel

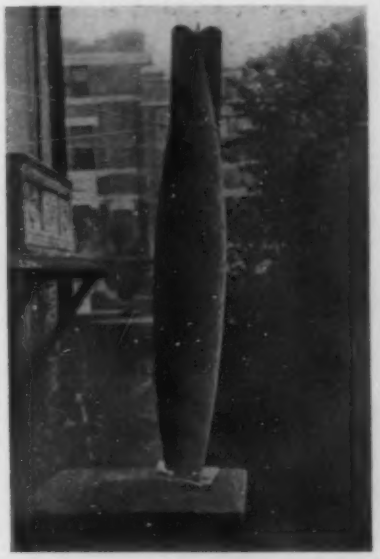
Use of reinforced concrete columns in place of steel avoided procurement problems and made possible completion of a 62- x 400-ft. shop in the fast time of six weeks at one of General Electric's works. The building's 42 reinforced concrete columns are spaced at 20-ft. intervals along either side of the structure. Approximately 2.3 cu. yd. of concrete were used in pouring each column.

FHA Loan Applications Highest in History

As an indication of the tremendous home construction volume potential, the FHA announced that during March a record number of loan applications were received. During March there were 28,662 applications under Title VI for $114,021,738 and 9,545 under Title II for $47,967,875. In addition there were 6122 applications in the amount of $28,091,261 under Title II, involving existing homes.

Concrete Bombs

Reports have come from abroad that the Germans have used concrete bombs to conserve steel. It is not probable that this country will use concrete for this purpose, but there may be possibilities of the use



Sample of concrete aerial bomb which was made but never used in the last World War

of incendiary concrete bombs where the destructive effect of steel fragments is not so important as the dispersion factor. Jos. F. Eilbacher, Anchor Building Co., Elizabeth, N. J., concrete products manufacturer relates his experience in the last World War when he was called upon to design and manufacture a sample concrete bomb. The government never did use it, but an illustration appears, herewith, of this sample.

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Complete

EQUIPMENT AND ENGINEERING SERVICE

Equipment for all phases of manufacturing concrete cinder block and other lightweight aggregate units. Our engineering service for new plants and modernizing old ones will help you operate more economically.

Hobbs block machines, Anchor tampers, Anchor *Jr.* strippers, Stearns power strippers, Stearns Jolicrete, Stearns mixers, pallets, Straublux Oscillating attachments, etc.

Repair parts for Anchor, Ideal, Universal, Stearns, Hystone mixers and others.

Anchor Concrete Mchy. Co.

G. M. Friel, Mgr., COLUMBUS, OHIO

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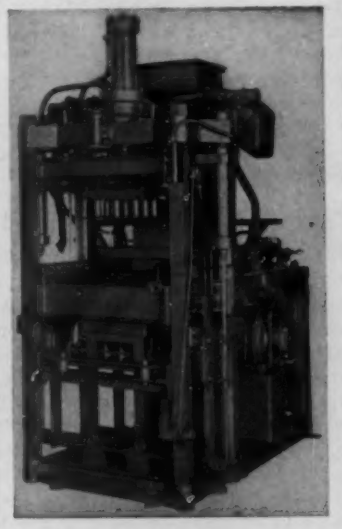

A High Production Machine Making Blocks which are Demanded by the Contractor Endorsed by the Architect Desired by the Mason

The KENT MACHINE CO.

CUYAHOGA FALLS, OHIO

Two New Gravel Units

AMORY CONCRETE GRAVEL CO., Amory, Miss., has erected two new sand and gravel plants, one at Columbus, Miss., and the other three miles west of Amory. The Columbus unit is a dredging operation, including a 6-in. Amsco pump powered with a 60-hp. semi-Diesel Caterpillar motor. At the new Amory plant, the dredge is equipped with an 8-in. Amsco pump powered with a 120-hp. semi-Diesel Caterpillar motor. Both plants have truck loading facilities. The main plant, with carloading facilities, is located on the Bartahatchee river on Highway 45. This plant is equipped with a 10-in. Amsco pump powered with a 150-hp. semi-Diesel Caterpillar motor. P. M. Hollis is in charge.

Mississippi May Start Crushing Plants

CONSTRUCTION of three agricultural limestone crushing plants was provided for by an Act recently passed by the Mississippi legislature. Either convict or free labor may be used, and the stone is to be sold to farmers at cost. No sites have been selected by government officials, but deposits are said to be available in Chickasaw, Tishomingo, Oktibbeha, Wayne, Rankin, Noxubee, Smith, Clay and Hinds counties.

Million Ton Contract

CONCRETE MATERIALS AND CONSTRUCTION CO., Cedar Rapids, Iowa, will erect a crushing plant at Edgerton, Ky., on the Tennessee line, to furnish one million tons of crushed stone on a government contract. Some of the equipment will be moved from a quarry operated by the company near Belle, Mo.

New Silica Wage Contract

PITTSBURGH PLATE GLASS CO., and the CIO Federation of Glass, Ceramic and Silica Sand Workers of the Crystal City, Mo., plant signed a new wage contract that is of general interest. The agreement was signed before a panel of the War Labor Board in Washington, D. C. Union demands for a check-off system, extra pay for Sunday work, and a union shop were dropped. Provisions cover 8500 employes in 13 plants of the Pittsburgh Plate Glass Company and the Libbey-Owens-Ford Co. The settlement provides for 5c an hour wage increase, and adjustment of wages to conform with variations in the living cost index of the Bureau of Labor Statistics. Union demands were for a 15c an hour increase.

The generally accepted cost-of-living index for the country is the average for a selected group of cities regularly surveyed by the Bureau of Labor Statistics. The index figure from month to month is based on 100 as the average for the period 1935 to 1939. The February 15 index figure was 112.6. A flat increase of 4c an hour was agreed on for each five-point rise in the index. In percentages, this works out to the advantage of the lowest-paid workers, who are the group hardest hit by any rise in the cost of living.

Move to Establish New Laboratory

UNITED STATES MINERAL WOOL CO. has moved from Jersey City to Emerson, N. J., to permit the acquisition of facilities for the Home Insulation Division to establish a sales training school and applicating laboratory. A very interesting folder was issued in connection with the move, giving the reasons for the change in address.

Silica Plant Opens

GEORGE F. ANDERSON, Quincy, Wash., has started operations at this silica plant at Okanogan, Wash. The Weyerhauser Lumber Co. is handling his products, which are used in paper manufacturing, replacing China clay which is not now available.

Higher Explosives Priorities

MINING ENTERPRISES operating under Preference Rating Order P-56 have been granted a higher preference rating to obtain explosives and explosive equipment under Amendment No. 5, issued April 14 by the Director of Industry Operations, W.P.B. Under the order as originally issued, a preference rating of A-8 was assigned to deliveries of operating supplies, including explosives. The new amendment, which adds explosives and explosive equipment to the types of machinery and supplies listed in Schedule A of the order, will allow mining enterprises to use a rating of A-1-c to obtain them, subject to quota restrictions.

Celebrate 50th Anniversary

MEDUSA PORTLAND CEMENT CO., Cleveland, Ohio, is celebrating the 50th anniversary of its founding this year. The company's first plant is at Bay Bridge, Ohio. Others are located at York and Wampum, Penn., Dixon, Ill., Silica, Ohio, and Paris, Ont. Celebrations will be held in the various cities where plants are located. About 160 employes attended the first golden anniversary banquet at Sylvania, Ohio. Officials attending included: J. B. John, president and general manager; P. G. Dawson, vice-president and treasurer; Frederick Pickford, secretary, and W. J. Worthy, general superintendent.

Freeze Phosphate Prices

PRICE ADMINISTRATOR Leon Henderson has issued an order, effective February 27, which forbids the retail sale of mixed fertilizers containing superphosphate and potash at prices above those at which any seller of fertilizer at retail did business during the five-day period from February 16 to 20, inclusive. Although it is a 60-day regulation period, the main fertilizer sales season in the South will be over after May 1, as 70 percent of the volume is usually sold before this date.

Carrara Buys Land

CARRARA PORTLAND CEMENT CO., which has been building a plant to manufacture both white and standard portland cement near Las Vegas, Nev., has purchased a 360-acre tract of land to protect its water rights at Carrara, Nev.

Open Quarry

F. C. GREEN, Astoria, Ore., has opened up a quarry on Bear Creek near here for the production of agricultural limestone. Production was under way April 15.

•

E. L. WARNER has started up a plant near Lincolnville, Okla., for the production of agricultural limestone. Mr. Warner, who has headquarters at Ottawa, Kans., operates three similar plants in Missouri.

New Pipe Plant

UNIVERSAL CONCRETE PIPE CO., Columbus, Ohio, has announced plans to construct a pipe plant in Nashville, Tenn., which will cost approximately $75,000.

HAZARD LAY-SET Preformed is *Preformed*

A Direct Quotation from MODERN WIRE ROPE DIGEST

PREFORMED Rope Bends More Easily

Much of the lack of resistance to bending fatigue in a non-preformed wire rope of any grade is due to the unresolved stresses introduced during the fabrication of wires into a rope—stresses that so react that they prevent the attainment of maximum resistance to bending fatigue. If wires are relieved of the tendency to fly away from the rope, the only factor determining resistance to bending fatigue is the natural resistance to bending, resident in the wires themselves. A PREFORMED rope bends more easily and with less additional stress on the metal. Therefore, a PREFORMED wire rope may be bent more often than one that is non-preformed.

Illustrating the strained position of wires in a non-preformed wire rope

Wires in a preformed wire rope lie at ease

PAGE 59

● More and more operators in practically all fields are recognizing the superiority of Hazard LAY-SET. They know that LAY-SET PREFORMED not only bends easier and thereby lasts longer, but that it handles easier, faster and safer. It resists kinking and whipping; practically refusing to rotate in sheave or drum grooves. For longer life and better service specify Hazard LAY-SET PREFORMED Green Strand. The Green Strand identifies the grade of steel as Improved Plow Steel.

GREEN SIGNIFIES SAFETY

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AMERICAN CHAIN & CABLE COMPANY, Inc.

BRIDGEPORT, CONN.

HAZARD LAY-SET *Preformed* WIRE ROPE

NEW EQUIPMENT

Convertible Testing Screen

GILSON SCREEN CO., Mercer, Penn., has developed an attachment for handling standard 8-in. sand sieves in conjunction with the Gilson testing

Testing screen originally designed for coarse gravel equipped with attachment for handling 8-in. sand sieves

screen which was originally intended only for coarse aggregate testing. The attachment is removable and larger trays can be used whether or not the attachment is in position. The illustration shows the screen attachment in action in the laboratory of The H. C. Nutting Co., at the United States ordnance plant at Ravenna, Ohio.

Fine Sand Recovery

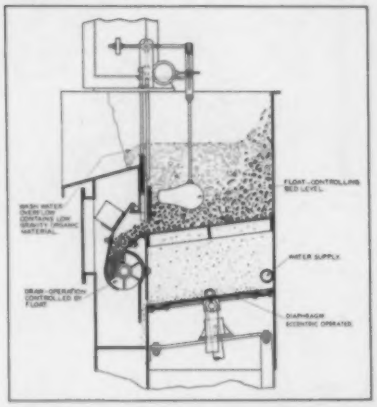
THE JEFFREY MANUFACTURING CO., Columbus, Ohio, makes a "Jeffrey Grit Washer," designed to take the grit out of sewage, which it is claimed to do very effectively. It had not occurred to any one, apparently, that the same device, or the same type of device, might be used to recover fine sand from loam and silt; or can it? Anyhow, knowing the great interest in this problem in the sand and gravel industry, we present a description of the "grit washer":

Grit removed from the channels is conveyed to the grit washer for complete washing—a separation by stratification and a washing of adhering organic solids from the grit obtains a clean grit product—dewaters it in this single unit—and returns the organics, free of gritty inorganics, to the flowing stream of sewage.

In this method the material admitted to the jig is formed into a bed on a screen plate within a box-like receptacle, and is there submitted to alternate upward and downward flow of wash water. The velocities of water flow are controlled to effect an opening or expansion of the bed and then closing it. Movement of the particles, one against the other, scrubs the inorganics and frees adhering organics which rise to the upper strata of the bed—the inorganics settling to the bottom strata.

The inorganic solids are of higher specific gravity than organic solids, therefore the particles of different characteristics can be stratified for subsequent separation.

To care for variations in the rate and character of feed it is necessary to maintain a bed of coarse or large size inorganics of predetermined depth on the screen plate. This is accomplished by operation of an au-



Designed to remove grit from sewage, the equipment may be adaptable for sand recovery operations

tomatically acting float-controlled device for withdrawing inorganics from the bed at the rate of their accumulation.

The washer consists of a plate steel tank of all welded construction mounted on a structural steel support. The bottom of the tank is a steel diaphragm plate, circular in shape, which is flexibly connected to the side walls of the tank by a sealtight rubber ring. Spaced above the diaphragm is an inclined screen plate having 3/8 in. diameter perforations upon which the bed of material is formed. These perforations permit the passage of the wash water and the discharge of fine grit.

The overall depth of the bed of material is maintained by an overflow weir placed at the end of the tank opposite the feed. An underflow weir at the same end of the screen permits discharge of coarse grit, under control of the float mechanism, to the elevator.

A continuous flow of water is introduced into the space between the screen plate and diaphragm, the quantity being sufficient to carry off the organic solids stratified in the uppermost layer of the bed.

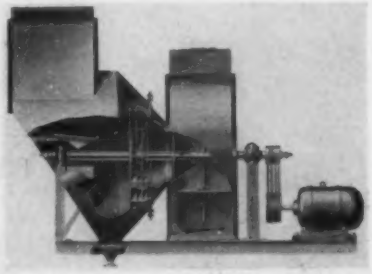
Movement of the diaphragm vertically, in timed cycles, through a connection with a power operated eccentric, causes the alternate opening and then closing of the bed of material formed on the screen plate.

Mechanical Dust Collector

CLAUDE B. SCHNEIBLE CO., Chicago, Ill., has designed what has been called the FiltreFan dust collector for the removal of dust and fly ash from flues, kilns and furnaces, smelter stacks and cupolas.

This unit consists of a combination housing on which is mounted a rejector wheel and fan wheel. As shown in the illustration, these two wheels are on a single motor-driven shaft. Solids are removed from the gas stream by means of this rejector wheel which throws the particles into a dead zone and hopper by centrifugal force. The dust particles do not come into contact with the wheel, eliminating wear on wheel blades.

Dust-laden air or gas enters the scroll of the rejector wheel through a tangential inlet. It is caused to rotate by vanes, throwing the dust particles outward against the scroll from which they travel to the discharging hopper. The cleaned air enters the periphery of the rejector wheel and is drawn toward the center between the side sheets and the



Dust collector installation cut away to show combination housing on which is mounted a rejector wheel and fan wheel

vanes. Through an outlet port in the center the air is drawn by a conventional fan wheel to be exhausted through an outlet duct.

(Continued on page 92)

To help you get the MOST out of your PRESENT RAW GRINDING MILLS

Based on the results obtained in the dry grinding of raw materials in the cement industry it is reasonable to expect that RDA—an inexpensive dispersing aid—can help you increase your grinding mill capacity and balance your production output. As illustrated in the chart below, RDA has shown marked production increases wherever used — (and in every basic type of grinding hookup). Where air separators are used, the effect of the dispersing agent RDA not only increases the efficiency of the ball mill but also increases efficiency of the separators.

In the cement industry secondary values also come from the more uniform particle size obtained. Kiln stock losses are decreased. The melt within the kiln is more easily controlled. The resultant clinker burned is usually easier to grind.

While we don't claim RDA can produce miracles with every product, the success so far encountered with many different materials suggests the value of at least a trial run at the present time where production is of so great national importance.

RDA

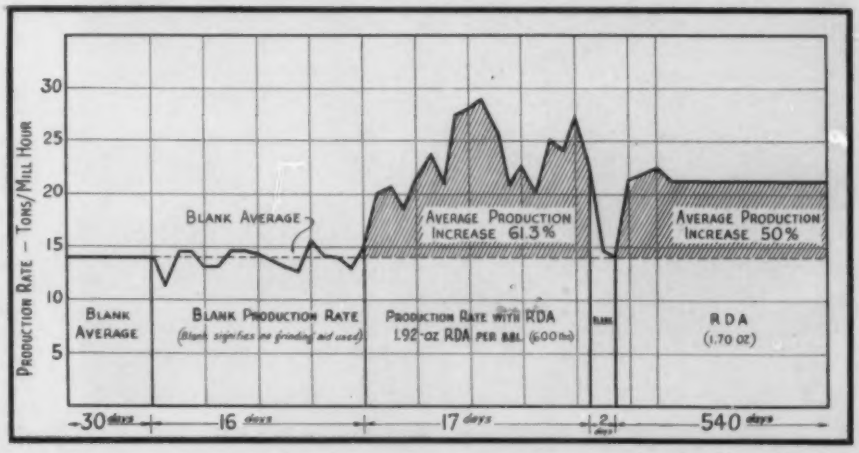
FOR GRINDING OTHER ROCK PRODUCTS

Other grinding operations such as limestone, feldspar, lime and talc may also find useful applications for the grinding and dispersing effect of RDA. Since it takes no expensive equipment to try RDA, isn't it worth investigating *today*? Our engineers will be glad to talk over your conditions and make specific recommendations.

DEWEY AND ALMY CHEMICAL COMPANY

CAMBRIDGE CHICAGO OAKLAND

Here's what one mill is getting with RDA grinding cement rock in a closed circuit hookup. Note the marked increase in production rate immediately upon adding RDA. Likewise note abrupt decrease when addition of RDA was temporarily stopped.



TDA
The accepted Grinding Aid
FOR PORTLAND CEMENT

RDA
FOR OTHER ROCK PRODUCTS

For high temperature stack gas, this dust collector is equipped with a hollow water-cooled shaft with packing glands and water connections provided at both ends. If desired, jets are placed in the refuser wheel housing. Water from these jets floods a portion of the scroll and hopper, both protecting against abrasion and insuring dustless removal of the solids.

Multiple Shovel-Control

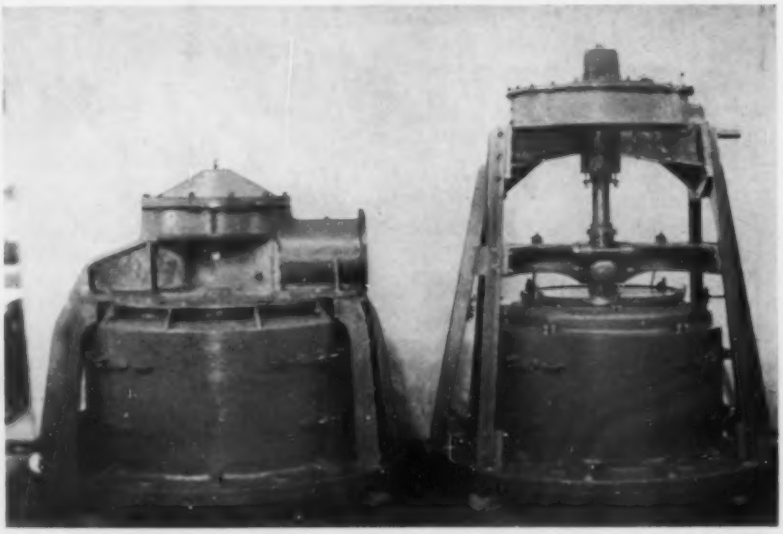
General Electric Co. has applied its amplidyne equipment for controlling all three motions of the shovel; hoist, swing, and crowd, to a 1200-ton, 35-cu. yd. stripping shovel. This control is said to require only three master switches to be operated manually and it demands only a small amount of current. As a result of the smooth, steady operation with this control, it is claimed that maintenance will be low on control parts, motors, and generators. The boom of the new shovel is 100 ft. long, the dipper stick is 60 ft. long, and the dipper itself has a capacity of 35 cu. yd. The dipper will make one scoop every 50 seconds.

Mast Head Shock Absorber

Keystone Driller Co., Beaver Falls, Penn., has designed a mast head shock absorber for its blast hole drill which is said to impart the line stretch necessary for efficient operation. When the switch from hemp to wire line was made, elasticity was lost and it became necessary to incorporate some device for absorbing shock and imparting stretch to the drilling line.

The Keystone mast-head consists of a very heavy coil spring placed under the crown pulley and a hydraulic recoil cylinder above. The spring has been in use for several years, but the recoil cylinder, shown in the illustration, is of recent design. The compression element used in the cylinder is oil, and its effect is said to be practically the same as that obtained from the snubbers on an automobile. The large spring gives stretch to the line and cushions the shock that would otherwise be transmitted from the drill bar to the machine. A recoil cylinder prevents backsnapping of the spring. The effect of the whole device is to prevent the whipping of the drill line and to eliminate the possibility of the machine catching the tools in the middle of a short stroke.

Shock absorber on mast head reduces wear on well drill



To the left, the new type B mill with a short shaft, and to the right, the older type Junior Hercules mill to show the difference in height

Short Shaft Pulverizer

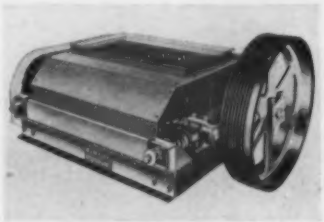
Bradley Pulverizer Co., Allentown, Penn., has developed an improved mill which is known as the type B Junior Hercules. It has been built to take material 1-in. and under, reducing it to a 20-mesh in a single operation. Output, of course, is dependent on the character of the limestone and the fineness of the finished product.

An advantage claimed for the type B mill is that the fineness can be changed at the will of the operator by merely changing the mesh of the screen on the mill.

This new machine is under 6-ft. in height, thereby reducing vibration and making a compact pulverizer. The principle of grinding is the same as in all Hercules mills; three rolls running against a die. It is a single stage pulverizer, producing the desired fineness without the use of auxiliary screens or air separators. When grinding through a 20-mesh sieve there is an appreciable amount of 100 and 200-mesh material in the finished product, making a desirable graded finished material.

Coal Crusher

McNally Pittsburg Manufacturing Co., Chicago, Ill., has developed a coal crusher which is particularly adapt-



Roll crusher designed to crush coal to the desired stoker sizes

able for the preparation of stoker sizes. As shown in the illustration it is a roll crusher type with segments having either cone or pyramid teeth.

Segments are easily removed. Segment ends are equipped with T-slots for heavy bolts which draw the machined and ground segment surfaces close to the hexagonal cast iron spiders which are likewise finished. To free the segments it is necessary only to loosen the bolts and slide them out of the T-slots.

Chicago Revises Building Code As War Measure

CHICAGO'S ancient building code was revised by the city council March 25 to make possible speedy erection of low cost housing for workers in war industries. Mayor Edward J. Kelly, in asking the revisions, declared that a serious shortage of low-rent and low-cost houses already exists in the city, and that probably 500,000 more workmen would require housing within the next two years because of war plant expansion.

Changes in the code include: Concrete slab foundation for frame construction, eliminating the basement formerly required; insulation will be required to reduce fuel demands; concrete block foundations may be used; concrete piers permissible as foundations for one-story dwellings; dry wall or plasterboard, or two-coat plaster walls now permitted instead of three-coat plaster formerly required; and gutters and downspouts may be eliminated. All changes conform to F.H.A. minimum requirements. Patrick F. Sullivan, president of the Chicago Building Trades Council, which has long fought any revision of the old code, is reported to have demanded a public hearing on the changes.

"Inside Arc Welding"

TO HELP speed war efforts through faster and better training of welding operators, the General Electric Company, Schenectady, N. Y., has arranged with a Hollywood studio to make six one-reel, all-color sound motion pictures. These sound pictures will show just what actually goes on inside the arc. Through the application of new methods of lighting, the all-color pictures will show the electric arc in operation, revealing details of the arc and crater impossible to photograph previously. The first of the pictures will cover the fundamentals of arc welding. The pictures are now ready for release to public, private, and industrial welding schools as well as other interested groups. Animated cartoons and actual welding shots will add punch to the treatment of the subject.

Pulverizing and Separating Equipment Bulletin

RAYMOND PULVERIZER DIVISION of Combustion Engineering Co., Inc., has just issued its bulletin No. 52 describing and illustrating its complete line of various types of mills, pulverizers, dryers, and air separators. The bulletin is 8½- x 11-in., and is perforated at the edge for convenience in filing in a loose-leaf binder.

Prevent Kiln End Lining Troubles with Amsco Alloy Segmental Nose Rings.

The damage to kiln end brick or refractory linings resulting from warping or distortion of the shell has been brought under control by Amsco Alloy Segmental Kiln End Nose Rings, according to reports of lime, chemical and portland cement producers.

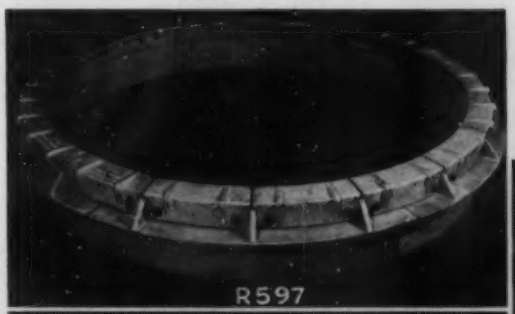
These users, several of whom have had over 10 years experience with them, have verified the contention of our metallurgists that alloys resistant to thermal stresses render their maximum efficiency when expansion and contraction are distributed over a series of small units, where possible, rather than over a single large area. A one-piece nose ring warps because it resists circumferential thermal expansion, but a segmental construction permits expansion of the adjoining sections cooperatively.

Even ordinary steel would render greater service in a ring of segmental construction than in a ring of one-piece construction. But an efficient multi-unit design, combined with the advantages of Amsco Alloy, results in a ring of maximum service life and minimum lining maintenance. Amsco Alloy is available in various grades, each suitable for a definite combination of high heat, fluctuating temperature or corrosion conditions. Grade F-10 is recommended for nose ring service. It withstands the constant attack of sulphurous gases, the high temperatures encountered in kilns; and has sufficient strength at elevated temperatures to support refractories and material in process.

Segmental kiln ends are available in diverse designs and with various numbers of segments per ring, depending on kiln diameter, linings, process and other factors. Two types of Amsco Alloy F-10 nose rings are shown. One (R-597) composed of 6 ring segments and 18 angle segments; and another (R-658) of 16 retaining and 32 wearing segments. C709 shows the latter as installed in a kiln end.

Cement, heavy chemical, and lime producers can benefit generally from Amsco's metallurgical and engineering experience. Amsco Alloy is cutting replacement costs and minimizing shut-downs for operators using feed spouts and pipe, dampers, clinker lifters and other operating parts subject to heat and corrosion.

Bulletin No. 108 pictures the modern foundry facilities, the metallurgical and 400,000 volt X-ray inspection laboratories and typical castings for all industries; and outlines the physical properties of the various grades of Amsco Alloy. Send for a copy.

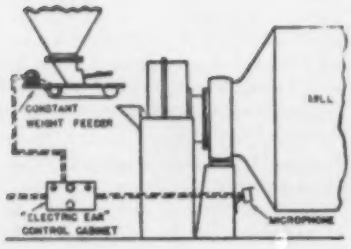


Amsco
AMERICAN MANGANESE STEEL DIVISION
OF THE AMERICAN BRAKE SHOE & FOUNDRY CO.
Chicago Heights, Illinois

Manganese Steel Castings for shocks and abrasion.
Chromium-Nickel Alloy Castings for heat and corrosion resistance.
Power Shovel Dippers. Dredge and Industrial Pumps.
Welding Materials for reclamation and hard-surfacing.

FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO. OFFICES IN PRINCIPAL CITIES

CONTROLLED MILL FEED



Use the "Feedometer" and "Electric Ear" Sound Control Unit with Your Ball, Pebble, Tube or Rod Mill to Maintain Maximum Production.

The "Electric Ear" Maintains the Mill at Maximum Capacity.

The "Feedometer" records the Weight Fed in Pounds, Tons, Barrels or Kilos.

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COMPANY, INCORPORATED
YORK, PA., Main Office & Works
NEW YORK, 122 East 42nd Street
CHICAGO, 205 W. Wacker Drive
SAN FRANCISCO, 501 Howard St.
TORONTO, 200 Bay Street

Magnesite from Brazil

IF DOMESTIC SOURCES of magnesite supplies should not be sufficient for our needs, it may be that Brazil will fill the gap. According to a U. S. Foreign Commerce Weekly report, the Ceara magnesite deposits in northern Brazil are said to be capable of supplying for export about 150 metric tons of calcined magnesite monthly. With a small amount of additional work this could be increased to about 1000 metric tons monthly, but would involve additional capital and the purchase of machinery.

Lime Advertising With War Motif

THE ILLUSTRATION herewith is about a half-size reproduction of an interesting full-page advertisement in the March issue of *Industrial and Engineering Chemistry*, by the Marblehead Lime Co., Chicago. It is to be hoped that the uninitiated will not conclude from the illustration that lime is made the way "puffed wheat" is manufactured!

Big Stone Contract

TRIANGLE ROCK & GRAVEL CO., San Bernardino, Calif., has been awarded a contract totaling $250,000 for concrete aggregate to be used in initial construction at an army air repair depot. Neal O. Baker is general manager of the company. To supply material for the project, the company will construct a new plant with a capacity of 275 tons an hour.

New Silica Plant

THE MISSISSIPPI VALLEY SILICA CO., New Orleans, La., recently completed a new silica processing plant which is said to have some unusual features.

The latest type of rotary kilns are used in the Marblehead, Chicago, plant, for calcining lime. They are 175 ft. long and 9 ft. in diameter, with a capacity of 300 tons per day.

"HOT SHOT"
CHEMICAL ENERGY
for Fast, Efficient Action
in all Chemical Lime Processes

MARBLEHEAD
High Calcium—High Quality
CHEMICAL LIME

IT is because Marblehead is manufactured as a *chemical* product, that it has achieved its present ranking position in the chemical lime field.

Extensive deposits of rich, pure limestone provide natural fine qualities which are jealously preserved in manufacture. The stone is calcined in the most modern rotary kilns, maintained in constant motion under uniform heat. Thus—even, thorough burning of the limestone is assured.

The result is a superior chemical lime, high in calcium, low in impurities—loaded with powerful chemical energy to do your job fast, efficiently and thoroughly. It turns out more product at lower cost—helps maintain uninterrupted production *now* when you need it most. Booklet "Modern Chemical Lime," on request.

OUTSTANDING PHYSICAL QUALITIES AS WELL

Fine physical characteristics are given as necessary for certain processes, as fine chemical qualities. Marblehead offers both fast and slow-settling lime—fine textured lime particles—smooth, consistent putty.

★ FOUR FORMS ★
TRY A CAR NOW IN YOUR OWN PLANT

MARBLEHEAD LIME CO.
160 N. LaSalle St.
Chicago, Ill.

Lime Company advertising which capitalizes on the public interest in the war

Misuse of Blasting Caps Blamed for Accident

A MOVE TO TIGHTEN regulations on handling explosives resulted from a Pennsylvania State investigation which reported that "old and unsafe" blasting caps may have caused the Lehigh Portland Cement Co. quarry blasting accident at Sandt's Eddy, Penn., that killed 31 men on March 26.

Lewis G. Hines, secretary of the Labor and Industry Department which made the inquiry, made public the findings with the assertion "it is my opinion that if the caps did not actually cause the explosion, they were a contributing factor."

He charged the powder company's technical expert committed "one of the most flagrant violations of safety that I or any of the other investigators have ever heard of," by transporting 1500 electric blasting caps, which Mr. Hines said were too old to be considered safe, from Dover, N. J., to the Lehigh quarry near Easton to be destroyed.

"After the explosion," said Mr. Hines, "about 42 of the caps were found. Most of them had been detonated. While it is impossible to say definitely that the caps caused the explosion, the presence of these caps on the property, in the vicinity of this operation, was a violation of State practice." The following day, he said, all investigators agreed that a premature explosion of the charge in Hole No. 33 had caused the blast.

Harry D. Immel, director of the department's bureau of inspection, said most experts were convinced that the premature explosion was caused by a rock dropping on one of the caps placed in the hole for destruction.

The caps, which were known to be between 5 and 6 years old, become "very unstable" as they age, according to Mr. Immel.

The charge brought a statement from the powder company's spokesman that "if the company employe was responsible for the presence of the caps in question at this quarry he was acting upon his own initiative and in direct violation of company practice."

The statement added that "our investigation disclosed that blasting caps had been found in the vicinity of the holes but no evidence has been discovered showing that the caps were old or unsafe or had been put in the holes or that they caused or contributed to the accident."

Quarry men and explosive manufacturers are to be summoned for a conference on new regulations, Secretary Hines said.

A study of State laws on handling explosives by the joint State Government Commission is provided in a resolution adopted by the House of Representatives.

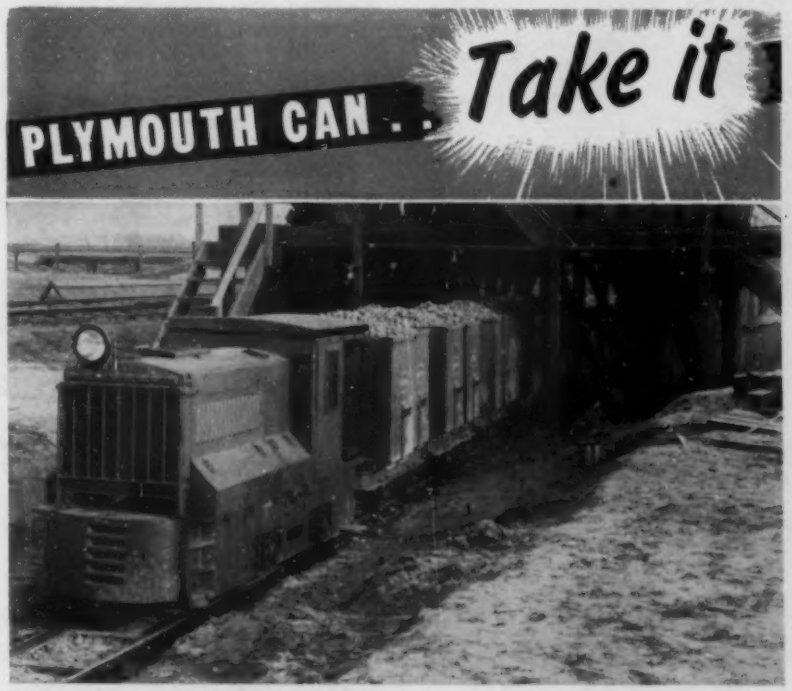
The above is taken from United Press and Associated Press dispatches from Harrisburg, Penn., dated April 11.

Reporter Ed Kennedy, of the *Easton Free Press*, graphically described the accident in his newspaper under date of March 27 as follows:

At 9:15 a. m. yesterday a group of more than 30 workmen were seated on the ground near the edge of the upper quarry of the Lehigh Portland Cement Co.'s plant at Sandt's Eddy.

Relaxed in the warm spring sunshine, they were eating a mid-morning lunch, talking and laughing.

They had just finished helping unload more than 20 tons of dynamite

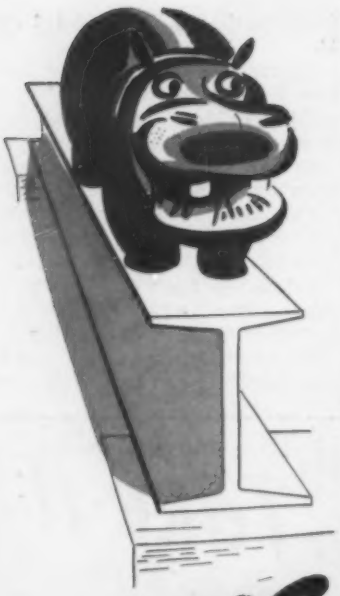


Takes a bigger load . . . Takes it faster
Takes rough usage without a "let down"

● If you want to see how much your daily tonnage capacity can be increased, how much time and money can be saved on haulage—put a Plymouth Locomotive on the job. Plymouth has POWER — to pull more tons per load; SPEED — to keep loads running on time; RUGGEDNESS — to stay in steady service on tough, punishing jobs in quarries, in sand, gravel and clay plants, in batch plant and yard duty. Add to these the easy operation, the extreme flexibility and the marvelous economy of this gasoline-powered locomotive and you see why "Plymouth means Performance"—at its best.

WRITE for FACTS ABOUT

PLYMOUTH GASOLINE and DIESEL LOCOMOTIVES
PLYMOUTH LOCOMOTIVE WORKS
Division of The Fate-Root-Heath Co. PLYMOUTH, OHIO, U. S. A.



NO SAG —IN RIGID, ONE-PIECE, WESTINGHOUSE CS MOTOR FRAMES!

...JUST ANOTHER POINT WHERE THEY'RE YEARS AHEAD!

J-21233-A

Westinghouse Electric and Manufacturing Co., East Pittsburgh, Pa.

from four trucks, brought to the quarry top to set off a big blast [34 well-drill holes] intended to knock down a whole section of quarry wall to feed a huge cement plant nearby. Talking and laughing, they paid scant attention to the hundreds of boxes of dynamite piled between them and the quarry edge.

The last of the four explosives trucks had just bumped away on the rough road to the Martin's Creek-Tatamy road. Assistant Foreman John Patti and eight workmen, who didn't then know how lucky they were, had gone down into the quarry hole to prepare to drill holes for the dynamite. Near the group of workmen were parked two dump trucks, used to haul away top dirt which had been removed from the quarry rock, two drilling machines, and a car which had brought three explosives experts to supervise loading the drill holes.

Workmen in the quarry heard a crashing roar on the quarry top. The wave of sound crashed on nearby hills, swept across surrounding farmland to break windows in Easton and Bethlehem, and to cause alarm in the Philadelphia area. Dense clouds of brown smoke puffed out from the hilltop, nearly covering the cloudless spring sky.

When the smoke and dust cleared, the group of workmen had disappeared. All instantly killed; none could tell what preceded the terrific blast. Most were blown to bits; only nine bodies were found sufficiently whole to be identified.

Workmen who ran from other parts of the plant found a scene of horror. The nine bodies were nude, all their clothing ripped off, and all were badly mangled. Parts of the other bodies were scattered over the entire hilltop; legs, arms, heads and smaller fragments were thrown as far as 300 yards.

Only trace of the stacked dynamite was kindling-wood pieces of the boxes. The car and two trucks were practically demolished, and the two large well drills were badly smashed.

Investigating officers commented on the fact that no hole was blown in the ground by the blast. The surface appeared practically undisturbed by the tremendous explosion which apparently blew upwards and outwards.

Stone Companies Pool Equipment for Large Army Contract

CRUSHED STONE aggregates for the construction of the Bluestone Reservoir on the New river at Hinton, W. Va., are to be produced by The General Crushed Stone Co., Easton, Penn., supplemented by the Acme Limestone Co., Fort Spring, W. Va., in a cooperative agreement calculated to utilize the machinery facilities of both, without excessive drain on manufacturers of equipment.

The project will consist of the construction of a dam and powerhouse to develop power and control floods, to be built under the supervision of the Corps of Engineers, U. S. War Department, Huntington, W. Va. Dravo Corp., Pittsburgh, Penn., has the contract to construct the dam, which will require about 1,254,000 tons of coarse and fine aggregates, which The General Crushed Stone Co. has contracted to furnish. Provided the Dravo Corp. secures the award of the contract for the construction of the powerhouse, the stone company will be obligated to furnish an additional 400,000 tons of fine and coarse aggregates.

The only established commercial producer of consequence in the vicinity is the Acme Limestone Co., which has a daily capacity of 2000 tons, which would require an investment of $100,000 or $125,000 to increase its daily output to 4000 tons—still far short of the daily requirements of the Dravo Corp.

Consideration was given by The General Crushed Stone Co. to the development of a new quarry and the building of a plant to produce 6000 tons a day—the daily requirements—and at times up to 7000 tons or even a little higher. After some exploration of the surrounding country, an arrangement was concluded with the Acme Limestone Co. which will effect a saving in the purchase of new machinery and in the development of an entirely new quarry.

The General Crushed Stone Co. is building a plant near to the Acme plant to produce 300 tons per hour or 4000 to 5000 tons in two 10-hour shifts. Additional tonnage over that capacity will be purchased from the Acme concern to bring the total to the requirements of the Dravo Corp.

Acme Limestone Co. will do all the drilling, stripping, blasting and the breaking up of the stone in the ledge

to bring it to the size suitable for handling by 2½-cu. yd. Diesel-electric shovels into 10- or 12-ton live-load Mack trucks. Stone prepared for loading from the ledge will be purchased from the Acme Limestone Co. The latter company has the quarry equipment sufficient in capacity to furnish rock for both plants. The General Crushed Stone Co., being a large producer with many crushed stone plants, is drawing much of the equipment necessary from several plants where it can be spared. It will include the two shovels needed, quarry trucks, a 48- x 60-in. jaw crusher from the LeRoy, N. Y., plant, a 20-in. gyratory and possibly some motors and screens.

This arrangement will make it possible to fill the contract with comparatively little purchase of new equipment; mainly conveyors and screens which are being obtained by extending the A-2 priority rating which the Dravo Corp. holds from the War Department. With this arrangement, the necessary equipment is being obtained.

Naturally, such an agreement has been looked upon with favor by federal authorities, who are concerned with the conservation of materials. The Dravo Corp. is assured aggregates from two reputable stone producers. Acme Limestone Co. is assured of continuous full capacity production until December 1, 1943, the date for scheduled completion of the project, and The General Crushed Stone Co. is being spared the difficulties and expense in opening a new quarry and building a tremendously expensive plant.

First shipments of aggregates are expected to start July 1. Edward Cole, superintendent of The General Crushed Stone Co. plant at Rock Hill, Penn., is supervising construction and will be in charge of operations. With the exception of a few key men, local labor will be used. Some stock will be built up in advance of shipments.

Stone sand production would impede high tonnage production, so only 10 percent of the total aggregates will be stone sand. The Dravo Corp. will ship in a dredged sand from the Kenahwa Valley, which involves high transportation costs, by water and then a rail haul. This sand is deficient in minus 100-mesh size. With a specification calling for 4 or 5 percent through 100-mesh, one-fourth of the sand used will be a stone sand with 15 to 25 percent through the 100. The two sands will be blended. Crushed stone is being produced 22 miles by rail from the dam site or 54 miles by truck. It will be shipped on the C. & O. railroad.

Cement Plant Safety Meeting

A RECENT CONFERENCE was held at Easton, Penn., by 75 representatives of cement plants in the Lehigh Valley district. F. L. Maus, safety director of the Alpha Portland Cement Co., was chairman of the sessions which had the following general theme, "Getting Safety Across to the Man in the Plant." W. H. Klein, vice-president of Penn-Dixie, presided at a luncheon meeting. F. G. McKelvy, president of Alpha, spoke on the subject, "The Executives' Interest In Safety." "Ideas In Health and Hygiene" were discussed by A. J. R. Curtis of the Portland Cement Association.

Sell Quarries

TOM N. HUDSON, Boone, Iowa, has purchased the limestone quarries of John Cashman at Sharpsville, Ohio, near Wilmington. Production will be stepped up to 100 tons a day. The plant at Sharpsville was constructed last year.

NO PORCUPINING HERE!

● **Union-Formed** (pre-formed) Wire Ropes end "porcupining." The wires, when worn through, lay flat to the rope, and the strand and wires stay in fabricated balance; do not develop high strands or drawn wires. **Union-Formed** ropes socket better—are more easily spliced—resist unraveling and unlaying when cut—and can be installed more easily. To keep orders moving, depend on **Union-Formed,** the better pre-formed Wire Ropes.

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ROPE DOPE
This informative wire rope periodical will be sent you without charge.

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Wire Ropes
The "ULTIMATE LOW COST WIRE ROPE"

FINANCIAL NOTES

RECENT DIVIDENDS

Alpha Portland Cem. Co.	$0.25	June 25
Consolidated Cement Corp. $1.40 Cl.A (np) (arrears).	.35	May 16
Eastern Magnesia Talc. Co. Com. (p20)	.50	Mar. 30
Lehigh Portland Cement Co.	.37½	May 1
Lehigh Portland Cement Co. pfd.	1.00	July 1
Medusa Portland Cement Co. Com. (np)	.50	April 6
Pacific Portland Cem. Co. 6½% pfd. (p100) (arrears)	1.00	April 29
Pennsylvania Glass Sand Corp. 5% pfd.	1.25	April 1
Superior Portland Cement, Inc., Class B	.50	May 1

PENNSYLVANIA GLASS SAND CORP., Philadelphia, Penn., and wholly-owned subsidiaries reported for the year ended December 31, 1941, a net profit of $746,937 after depreciation, depletion, interest, amortization, federal income and excess profits taxes, etc., equal after preferred dividends, to $1.83 a share on 321,860 shares of common stock. This compares with $806,837 or $1.97 a common share in 1940. Consolidated income account for the year 1941, compares as follows:

	1941	1940
Net sales	$4,005,969	$2,922,401
Cost and expense	2,192,891	1,605,500
Depreciation and depletion	230,362	203,806
Oper. profit	$1,582,716	$1,113,095
Other income	56,003	50,320
Total income	$1,638,724	$1,163,415
Interest, etc.	151,674	193,962
Income taxes	740,113	162,616
Net profit	$746,937	$806,837
Pfd. divs.	155,000	170,432
Com. divs.	402,325	321,800
Surplus	$189,612	$314,605

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SUPERIOR PORTLAND CEMENT, INC., Seattle, Wash., reported a net income of $527,261, after charges, for the year ended December 31. This compares with $490,603 for a like period in 1940.

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ALBERENE STONE CORP. of Virginia, New York, N. Y., had net sales of $60,567 for December, 1941. This compares with $50,695 for the same month in 1940.

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OHIO RIVER SAND CO., Louisville, Ky., reported a net income of $92,247 in 1941 as compared with a net income of $67,229 in 1940.

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CONSUMERS CO., Chicago, Ill., reported a profit of $282,799 in 1941, not including profit on bonds reacquired, compared with $29,239 in 1940. This compares with a net income of $29,239 in 1940, and a loss of $114,057 in 1939.

•

PEERLESS CEMENT CO., Detroit, Mich., reported the following income account for the years ended December 31:

	1941	1940
Operating profit	$ 749,983	$ 641,274
Depreciation	114,168	114,571
Net operating profit.	635,815	526,703
Other income	28,959	24,497
Total income	664,774	551,200
Bond interest	26,260	52,552
Fed. income tax	[1] 155,000	100,500
Idle plant exp.	66,000	31,661
Net income	417,515	366,487
Dividends	[2] 154,873	.....
Surplus for year	262,642	366,487
Earn. Surplus, 1-1	1,044,610	674,227
Adjustments	[2] 675,675	cr3,896
Earn. surp., 12-31	631,576	1,044,610
Earned per share	$1.34	$1.18
No. of shares	309,826	309,826

[1] No provision necessary for excess profits taxes.

[2] Includes $639,675 balance of appropriation necessary to effect increase in capital stock from $1 stated value to $5 par value per share.

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PRESSED STEEL CAR CO., INC.
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PITTSBURGH, PA.

AMERICAN LIME & STONE CO., Bellefonte, Penn., presented the following statement of income for the years ended December 31:

	1941	1940
Sales	$1,504,500	$1,161,546
Oper., etc., exp.	1,217,403	958,414
Deprec. & deplet.	146,079	147,768
Operating profit	141,018	55,365
Other income	15,504	13,399
Total income	156,523	68,764
Interest, etc.	67,399	74,398
Income taxes	45,000	4,000
Net profit	44,124	*d* 9,633
[1]Times chg. earn.	2.32	0.92
Earn., com. share	$4.41	*d* $0.96
No. of com. shares	10,000	10,000

[1] Before income taxes.

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BASIC REFRACTORIES, INC., Cleveland, Ohio, showed a net profit of $450,592 for the year ended December 31. This compares with a profit of $445,890 for a like period in 1940.

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THE WARNER CO., Philadelphia, Penn., presented the following comparative statement of net income for the years ended December 31:

	1941	1940
Net sales	$9,676,570	$5,641,154
Cost of sales	6,563,225	4,206,308
Deprec. & deplet.	334,271	287,696
Selling expense	279,089	244,083
Admin. expense	271,045	175,976
Operating profit	2,228,940	727,090
Secur. income	44,052	40,897
Total income	2,272,992	767,987
Inc. chgs., net	230,462	121,192
Balance	2,042,531	646,795
Bont int., etc.	316,746	338,287
Bond disc. & exp.	33,863	34,549
[1]Income taxes	437,000	24,047
Prov. for conting.	75,000	.....
Net profit	1,179,922	249,912

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CONSOLIDATED ROCK PRODUCTS CO., Los Angeles, Calif., had the following income account for the years ended December 31:

	1941	1940
Net sales	$4,780,974	$3,191,672
Costs & expense	4,265,174	3,081,025
Deprec. & deplet.	155,560	170,430
Operating profit	360,240	*d* 59,783
Other income	67,675	51,201
Total income	427,915	*d* 8,582
Bond interest	177,190	177,190
Bond discount	13,059	13,463
Other expenses	50,213	10,520
Net income	187,453	*d* 209,755

Note: There appears to be no liability for Federal excess profits and income taxes for 1941.

•

FLORIDA PORTLAND CEMENT CO., Chicago, Ill., with plant at Tampa, Fla., had a net income of $575,164 for the year ended December 31, 1941. This compares with $622,784 for 1940. Net sales in 1941 were $4,573,369 as compared with $3,930,315 in 1940.

•

PENNSYLVANIA GLASS SAND CORP., Lewistown, Penn., reported a net income of $746,937 for the year ended December 31, 1941. This compares with $806,837 in 1940. However, net sales in 1941 were $4,005,969 as against $2,922,401. Much higher taxes reduced the net return in 1941.

MATERIAL SERVICE CORPORATION, Chicago reported a net profit of $671,258 for the year ended December 31, 1941 as compared with a net income of $663,324 for the like period in 1940. Net sales were the highest on record, $13,090,407, in 1941. This compares with 1940 sales of $11,228,619.

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PACIFIC COAST CEMENT CO., Seattle, Wash., will redeem on June 1, 1942 all of its first mortgage, six percent sinking fund gold bonds Series A, due December 1, 1942.

SOUTHERN PHOSPHATE CORPORATION, Baltimore, Md., showed a net profit of $192,331, after charges, for the year ended December 31, 1941 as against $151,775 for a similar period in 1940.

•

CALAVERAS CEMENT CO., San Francisco, Calif., had a net income of $154,248 for the year ended December 31, 1941, as against $54,933 for a similar period in 1940. Net sales in 1941 were $1,754,044 as compared with $1,168,514 in 1940.

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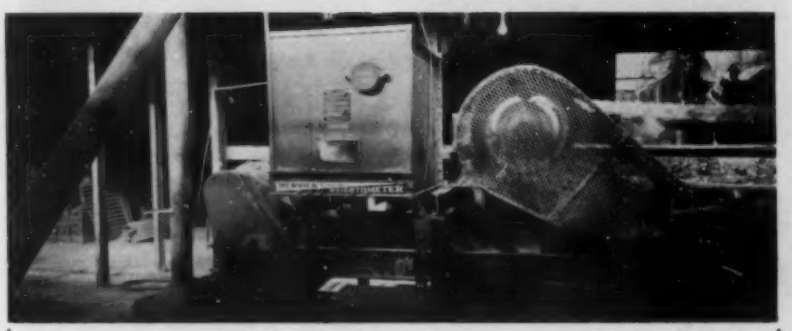

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Big Crushed Stone and Ready Mix Contracts

CHAMBERSBURG STONE CO., Chambersburg, Penn., and L. B. SMITH, INC., Camp Hill, Penn., have contracts to furnish 900,000 to 1,000,000 tons of crushed stone for construction of a new United States ordnance depot. Chambersburg Stone Co. is to produce 600,000 tons from its Chambersburg plant and the Shippensburg Stone Co. plant and has enlarged its plant at Chambersburg so that the two together can produce 4000 tons a day. Equipment added includes a 25- x 40-in. Cedar Rapids jaw crusher, a 3-ft. Telsmith Gyrosphere reduction crusher, two vibrating screens and an auxiliary wood bin. Otherwise the original plant is unchanged.

About 74 miles of crushed stone surface roads are to be built to serve concrete storage igloos within the ordnance plant and there will be 60 miles of main roads constructed. L. B. Smith, Inc., has set up a Cedar Rapids portable plant near the job location to produce an estimated 300,000 tons for road construction purposes. The Chambersburg concern is to furnish stone for roads and for all the concrete. U. S. Transit Mix Concrete Corp., New York, N. Y., has a contract for about 175,000 cu. yd. of transit mixed concrete. A batching plant is being set up and about 40 transit mixers will be put into operation. Walker Bros., Chambersburg, the contractor, is handling an estimated 12,000 cu. yd. of transit mix concrete for bridges and miscellaneous construction. A batching transfer plant has been set up for the purpose and two 3-cu. yd. Rex high dump transit mixers on Ford chassis purchased to increase the fleet to six.

Industrial Sand Convention

ANNOUNCEMENT has been made by the National Industrial Sand Association that the 1942 annual meeting will be held at the Palmer House, Chicago, Ill., on June 4 and 5. Plans to hold the meetings at The Homestead, Hot Springs, Va., were cancelled due to situations growing out of the war emergency.

Packing Plant Fire

PACIFIC PORTLAND CEMENT CO., Redwood City, Calif., reported a fire at its cement packing shed caused damage estimated at several thousand dollars. A. G. Lang, chief engineer, explained that welders were not careful enough about where the sparks were flying. As a result about 250 ft. of the 500-ft. conveyor belt connecting the packing house with the dock was destroyed. Workmen were cutting a 3-in. steam line, and the sparks ignited the conveyor belt and spread to the tinder-dry shed. No damage was done to the mill building and wharf.

Fellowship Offered by the Sand and Gravel Assn.

ANNOUNCEMENT has been made by the National Sand and Gravel Association that the University of Maryland in cooperation with the association will offer a fellowship for research on appropriate problems related to the sand and gravel industry. The Stanton Walker Fellowship amounts to $600 for the year.

Cement Production at High Level

BUREAU OF MINES reports that the portland cement industry in February, 1942, produced 10,813,000 bbl., shipped 8,285,000 bbl. from the mills, and had in stock at the end of the month 25,714,000 bbl. Production and shipments of portland cement in February, 1942, showed increases of 29.6 and 11.1 percent, respectively, as compared with February, 1941. Portland cement stocks at mills were 1.6 percent higher than a year ago.

In the following statement of relation of production to capacity the total output of finished cement is compared with the estimated capacity of 155 plants at the close of February, 1942, and of 156 plants at the close of February, 1941.

RATIO (PERCENT) OF PRODUCTION TO CAPACITY

	Feb. 1941	Feb. 1942	Jan. 1942	Dec. 1941	Nov. 1941
The month..	43.4	57.0	58.6	64.8	72.7
12 months...	54.4	68.6	67.3	65.4	64.5

Sand-Lime Brick Production and Shipments

SIX active sand-lime block and brick plants reported for March and eight for February, statistics for which were published in April.

AVERAGE PRICE FOR MARCH

	Plant Price	Delivered Price
Detroit, Mich.	....	$16.00
Sebewaing, Mich.	$11.50	....
Saginaw, Mich.	12.00	....
Grand Rapids, Mich.	....	15.00
Seattle, Wash.	16.50	18.50
St. Louis, Mo.	....	....

STATISTICS FOR FEBRUARY AND MARCH

	*February	**March
Production	2,135,980	1,381,900
Shipments (rail)	295,000	255,000
Shipments (truck)	1,741,503	1,220,258
Stock on Hand	1,440,999	1,078,124
Unfilled Orders	880,000	950,000

* Eight plants reporting: incomplete, two not reporting stock on hand and three not reporting unfilled orders.

** Six plants reporting: incomplete, one not reporting stock on hand and two not reporting unfilled orders.

Recent Rate Changes

Following are the latest proposed changes in freight rates up to and including the week of April 18

Central

69553 (Sup. to W. D. A.). Limestone, ground or pulverized, C. L., min. wt. 80,000 lb. W. D. A.. 69553, D. B. 3111, dated Jan. 8th, covering proposal to establish rate of 260c per net ton on, from Speeds, Ind., to Tallacoosa, Ala., is hereby withdrawn from the docket on request of the proponent.

69554. Sand, all kinds, and gravel, in open top cars, C. L. Establish on, from Slocums, O., to points in Ohio, rates as shown below:

From Slocums, Ohio
(Rates in cents per net ton)

To	Proposed Representative Rate	To	Proposed Representative Rate
Ironton, O.	66	Loveland (Clermont, Ky.), O.	127
Portsmouth, O..	44	Mt. Sterling, O..	116
Lancaster, O....	116	Washington Court House, O.	110
Columbus, O. ..	116	Winchester, O. .	99
Cincinnati, O...	138	Sardinia, O.	105
Newark, O.	138	Batavia, O.	116
Middletown, O..	138	Newtown, O.	127
Lima, O.	160	Waverly, O.	66
Black Ford, O...	55	Kingston, O.	105
Wellston, O. ...	88	Circleville, O. ..	110
Greenfield, O. ..	105		
Blanchester, O..	127		

69577. Industrial sand, as per usual description, C. L. Establish on, from the so-called Ludington groups, viz.; Ludington and Manistee, Mich., in open and closed cars, to Attica, N. Y., 308c; Auburn, N. Y., 352c; Batavia, N. Y., 319c; Blossburg, Pa., 374c; Bradford, Pa., Dansville, N. Y., 330c; Elmira, N. Y., 352c; Geneva, N. Y., 341c; Olean, N. Y., 330c; Oswego, Painted Post, N. Y., 352c; Rochester, N. Y., 330c; Seneca Falls, N. Y., 341c; Syracuse, N. Y., 352c; Williamsport, Pa., 374c per net ton.

69855. Sand (industrial), and gravel, in open top cars, C. L. Establish on, from Clyde, W. Va., to Sattes and Institute, W. Va., 66c per net ton, via N. Y. C. (W) direct.

69857. Sand (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, moulding or silica), in open top cars, or gravel in all kinds of equipment, C. L. Establish on, from Mantua, O., to Geneva, Stony Point, Kankakee, Ill., b 111c; Greencastle, Ind., c 97c, and Limedale, Ind., d 97c per net ton.

69858. Sand, gravel and crushed stone, C. L. W. D. A. 69858, D. B. 3116, dated Feb. 10th, covering proposal to establish rates on (a) sand (except blast core, engine, filter, fire or furnace foundry, glass, grinding or polishing, loam, moulding or silica) and gravel, C. L., from certain points in Ind. and Joliet, Ill., to Dana, Ind., and (b) crushed stone, C. L., from certain points in Ill. and Ind. to Dana, Ind., is hereby amended by providing for proposed rate of 99c per net ton from Indianapolis, Ind., under proposition (a) and eliminating same from proposition (b).

69859. Sand, as described below. Establish on (a) sand, naturally bonded moulding, in all kinds of equipment, C. L.; sand (industrial), in closed equip-

Note 1—Minimum weight marked capacity of car.

Note 2—Minimum weight 90% of marked capacity of car.

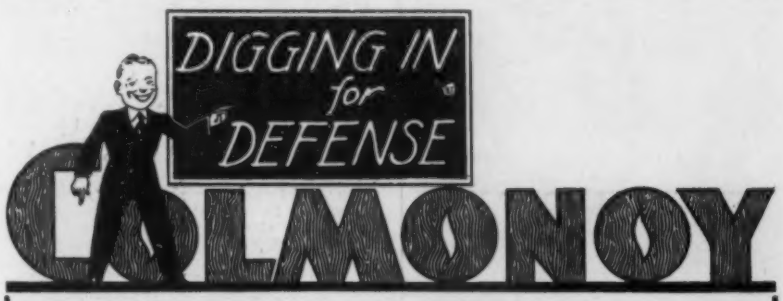
Note 3—Minimum weight 90% of marked capacity of car, except that when car is loaded to visible capacity the actual weight will apply.

Note 4—Reason. No present or prospective movement.

Note 5—Reason: Comparable with rates from other origins in immediate vicinity.

Note 6—Rates will not apply on shipments in cars with tarpaulin or other protective covering. In such instances the rates applicable on shipments in box cars are to be assessed.

Note 7—The oil, tar or asphaltum not to exceed 10% of weight of the commodity shipped, the shipper to so certify on shipping order or bill of lading.



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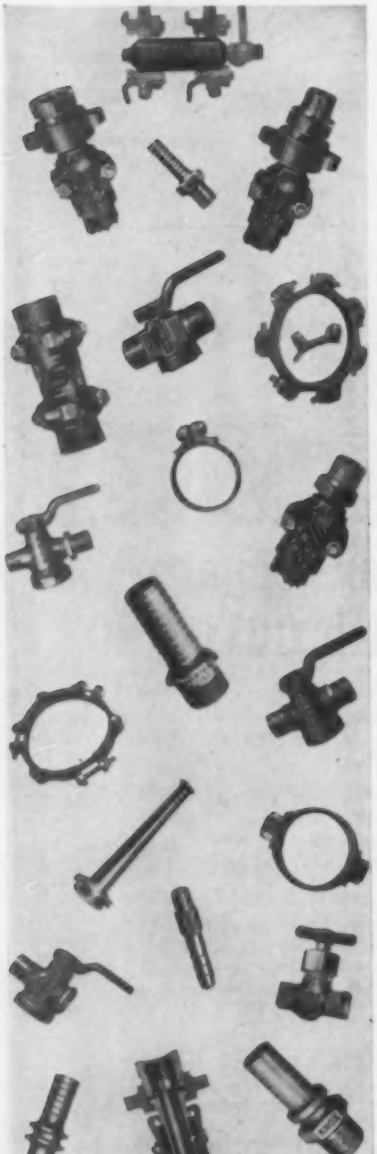

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ment, C. L.; (b) sand (industrial), in open top equipment, C. L., from Havens, O., to South Bend, Ind., (a) 198c; (b) 160c per net ton.

69877. **Dolomite, roasted** (refractory dolomite, in granular form, treated or untreated, clinkered or burned to a dead state), C. L. Establish on, from Nario, O., to Sterling, Ill., 280c per net ton.

69910. **Sand** (industrial), in open top cars or **gravel** in all kinds of equipment. (See Note 3.) Establish on, from Akron, O., to Geneva, Stony Point, Kennard, Greenville, Shenango Transfer and Pymatuning, Penn., 110c per net ton.

69925 (2). **Slag**, in bulk, in open top car equipment, C. L. Establish on, from Pittsburgh, Penn., to Boetcherville, Md., 176c per net ton, via P. & L. E.-Connellsville, Penn.-W. M.-Cumberland, Md.-C. & P.

69926 (2). **Agricultural limestone**, unburnt, in open top cars, C. L. Establish on, from Woodville, O., to Bellaire, O., 171c; Cambridge, O., 149c; Lore City and Quaker City, O., 160c per net ton.

69927 (2). **Stone, fluxing, furnace or foundry, melting or refractory, unburnt**, in bulk, in open top cars, C. L., min. wt. 90 percent of marked capacity of car, except that when cars are loaded to full cubical or visible capacity, actual weight will apply. Establish on, from Northwestern Ohio Group 1 origins to Economy, Penn., 134c per gross ton.

69939. **Dolomite, roasted** (refractory dolomite, in granular form, treated or untreated, clinker or burned to a dead state), C. L., min. wt. 80,000 lb. Establish on, from Nario and Maple Grove, O., to Duluth and Steelton, Mich., 27c, via routes over which the present rate applies.

69939. **Dolomite, roasted** (refractory dolomite, in granular form, treated or untreated, clinker or burned to a dead state), C. L., min. wt. 80,000 lb. W. D. A. 69939, D. B. 3118, dated Feb. 24, 1942, covering proposal to establish rate of 27c on, from Nario and Maple Grove, O., to Duluth and Steelton, Minn., is hereby amended by including Bettsville, Durbin, Martin, Millersville and Woodville, O., as origin points, subject to the same proposed rate (27c) shown therein.

69956. **Sand** (Industrial), and **gravel**, in open-top cars, C. L. Establish on, from Clyde, W. Va., to Clendennin, Cornwell, W. Va., 88c; Elkland, W. Va., 99c; Dundon, W. Va., 110c; Gassaway, W. Va., 132c; Burnsville, W. Va., 143c per net ton, via N. Y. C. (W), Blue Creek, W. Va., B. & O. R. R.

69957. **Agricultural limestone, unburnt**, in open top cars; **Agricultural limestone screenings**, in open top cars; **stone, crushed, also stone screenings**, in open top cars, straight or mixed carloads. Establish on, from Woodville, O., to Marion, O., 105c; Peoria, O., 116c; Durbin, O., 127c; Kenton, O., 105c; Spencerville, O., 110c; Ohio City, O., 116c; Wren, O., 127c per net ton.

70061. **Agricultural limestone, unburnt**, in open top cars; **agricultural limestone screenings** in open top cars; **crushed stone and crushed stone screenings** in open top cars. Establish on, from Woodville, O. Proposed rate (in cents per net ton) to Stickney, O., crushed stone and crushed stone screenings, 105c; agricultural limestone and agricultural limestone screenings, 110c; Route 1, via P. R. R.-Lima, O., D. T. & I. To Denson, O., crushed stone and crushed stone screenings, 99c; agricultural limestone and agricultural limestone screenings, 99c; Route 2, via P. R. R.-Toledo, O.-D. T. & I.

70062. **Limestone, agricultural**, C. L. Cancel all rates on, from Walford, Hillsville and Shaw Jct., Pa., to points in Ill., Ind., Ia., Ky., Mich., Mo. and Wis., published in P. & L. E. Trf. I. C. C. 3301 and similar rates in other individual lines' tariffs, account obsolete.

70064. **Sand** (industrial) and **gravel**, in open top cars, C. L. Establish on, from LaFayette, Ind., to Dana, Ind., 105c net ton.

70084. **Stone, crushed, and stone screenings**, in open top cars, straight or mixed carloads. Establish on, from Marble Cliff and West Columbus, O., to Lockbourne, O., 50c per net ton.

70095. **Slag** (a product of iron and steel blast or open hearth furnaces), crushed or crushed commercial, other than granulated, in bulk in open top cars, C. L. Establish on, from New Boston and Portsmouth, O., to Chillicothe, O., 94c per net ton.

70097. **Crushed stone**, in bulk, in open top cars only and **crushed stone screenings**, in bulk, in open top cars, C. L. Establish on, from Maple Grove and Nario, O., to St. Louis, Mich., 160c per net ton.

70104. **Slag**, C. L. Establish on, from Detroit, Mich., to Ft. Wayne, Ind., 132c per net ton.

70112. **Industrial sand** per usual descriptions (a), (b) and (c). Establish on, from Black's Siding, Mich., to Hasbrouck Heights, N. J., (a) 385c; (b) 424c; (c) 385c per net ton, via D. C. & S.-G. T.-C. N.-G. R.-Erie-N. J. & N. Y.

70119. **Sand** (industrial) and **gravel**, in open top cars, C. L. Establish on, from Cayuga, Ind., to Dana, Ind., 77c per net ton, via N. Y. C. & St. L.-Humrick, Ill.-C. M. St. P. & P.

70141. **Crushed stone and crushed stone screenings**, in bulk in open top cars, C. L., to full cubical or visible capacity, actual weight will apply. Establish on, from Spencer, Ind., to Worthington, Ind., 50c per net ton.

70142. **Stone, rip rap**, C. L. (See Note 3). Establish on, from Strangford and Gray, Penn., to Bridgeburg, Penn., 143c per net ton. The master tariff under Ex Parte 148, issued by Agent Curlett is to be applied in connection with this rate.

70184. **Slag, granulated**, in open top cars. Cancel present rate of 297c per net ton on, from Cleveland, O., to Binnewater, N. Y., classification basis to apply in lieu thereof.

Sup. 2 to W. D. A. 69553. **Limestone, ground or pulverized**, C. L. Sup. 1 to W. D. A. 69553, D. B. 3117, dated Feb. 14, 1942, which withdraws from the docket W. D. A. 69553, covering proposal to establish rate of 260c per net ton on, from Speeds, Ind., to Tallacoosa, Ala., is hereby cancelled, thus reinstating proposition as set forth in the docket advice.

Sup. 1 to W. D. A. 69877. **Dolomite, roasted (refractory dolomite**, in granular form, treated or untreated, clinkered or burned to a dead state), C. L. W. D. A. 69877, D. B. 3117, dated Feb. 16, covering proposal to establish rate of 280c per net ton on, from Nario, O., to Sterling, Ill., is hereby amended by providing for addition thereto of following:

Proposed rates from Bettsville, Gibsonburg, Maple Grove, Millersville, Woodville, O., to Sterling, Ill., 280c per net ton.

Proposed rates from Durbin, O., to Sterling, Ill., 287c per net ton.

70207. **Sand, all kinds and gravel**, in open top cars, C. L. (See Note 3). Establish on, to Cheviot, O., from Vigo, O., 127c; Coalton, O., 138c; Overpeck, O., 88c; Zanesville, O., 149c per net ton.

70217. **Fluorspar**, in packages or in bulk, C. L., min. wt. 40,000 lb. Establish on, to Clarion, Penn., from Brookport, Golconda, Homberg, Metropolis, Ill., and Evansville, Ind., 578c per net ton, and from Cochrans Spur, Eichorn and Rosiclaire and Stewart, Ill., 611c per net ton, subject to Ex Parte 148 increase.

70251. **Sand and gravel**, C. L., as described in Item 200-B, C. F. A. L. Tariff 575-A, Sup. 14, page 3. Establish on, from Coalton Group to Westernport, Md. Description (a) 231c; (b) 254c; (c) 200c per net ton.

70279. **Sand, all kinds and gravel**, in open top cars, C. L. Establish on, from Sandusky, O., to Lockbourne, O., 127c per net ton.

70315. **Slag** (a product of iron and steel blast or open hearth furnaces), C. L. (See Note 3). Establish on, from Toledo, O., to Fort Wayne, New Haven, Gar Creek and Woodburn, Ind., 116c per net ton.

70316. **Agricultural limestone**, unburned (not ground or pulverized), in bulk in open top cars only, C. L. (See Note 3). Establish on, from Narlo, O., to Denson, O., 110c per net ton.

70323. **Lime, common, hydrated, quick or slaked**, C. L., in bags, barrels, casks, iron drums or in bulk. Amend agency and individual lines' tariffs publishing rates on, from Mosher, Ste. Genevieve, Hannibal, Mo., Marblehead and Quincy, Ill., to Belle Vernon, Bessemer, Crabtree, Elizabeth, Kittaning, McKeesport and Pittsburgh, Penn., by providing for the application of said rates to stations taking same rates or arbitraries higher named in Agent Jones' Trf. 470-B.

70379. **Sand (all kinds) and gravel**, in open top cars, C. L., min. wt. Establish on from Botzum, O., to Columbian, O., 105c per net ton, via B. & O. R. R.-Canton, O.-P. R. R., subject to Ex Parte 148 increase.

70405. **Limestone, agricultural, unburnt** (not ground or pulverized), in bulk, in open top cars, C. L., will apply. Establish on, from Genoa, Martin and Marblehead, O., to destinations in Ohio, rates as shown below.

(Rates in cents per net ton)
[Representative]

To	(1)	(2)
Ansonia, O.	138	149
Athens, O.	171	...
Batavia, O.	193*	182
Bellefontaine, O.	116	...
Belpre, O.	182	...
Caldwell, O.	171	160
Celina, O.	127	...
Chillicothe, O.	160	...
Circleville, O.	149	...
Columbus, O.	138	...
Covington, O.	138	149
Dayton, O.	138	...
Gallipolis, O.	193	...
Hamilton, O.	160	160
Hillsboro, O.	182	...
Ironton, O.	193	...
Jackson, O.	171	171
Lancaster, O.	149	...
Logan, O.	160	...
Loveland, O.	160	171
McConnellsville (Malta), O.	171	...
Marietta, O.	182	...
Middletown, O.	149	...
Pomeroy, O.	193	182
Portsmouth, O.	193	...
St. Marys, O.	116	127
St. Paris, O.	127	138
Sardinia, O.	193*	182
Savona, O.	149	149
Sidney, O.	127	138
South Charleston, O.	138	149
Springfield, O.	138	...
Summitville, O.	149	...
Troy, O.	138	149
Urbana, O.	127	138
Versailles, O.	138	149
Wapakoneta, O.	116	127
Wellston, O.	171	...
West Manchester, O.	149	...
Wilmington, O.	160	160
Xenia, O.	149	149

(1) Proposed rates from Genoa and Martin, Ohio.
(2) Proposed rates from Marblehead, Ohio.
*$1.93 necessary to clear Portsmouth, Ohio.

Southwestern

27531. **Stone**, Cache, Cold Springs, Mountain Park, Roosevelt and Snyder, Okla., to Pueblo, Colo. To establish rates of 51c per 100 lb. on polished stone group, carloads, min. wt. 40,000 lb.; 42c per 100 lb. on dressed stone group, and 36c per 100 lb. on rough stone group, carloads, min. wt. 50,000 lb., from Cache, Cold Springs, Mountain Park, Roosevelt and Snyder, Okla., to Pueblo, Colo.

27538. **Stone**, Cache, Cold Springs, Mountain Park, Roosevelt and Snyder, Okla., to Champaign, Ill. To establish rates of 104c per 100 lb. on less carload stone, 45c per 100 lb. on polished stone group, carload min. wt. 50,000 lb.; 29c per 100 lb. on dressed stone group and 28c per 100 lb. on rough stone group, carload min. wt. 40,000 lb., from Cache, Cold Springs, Mountain Park, Roosevelt and Snyder, Okla., to Champaign, Ill.

27552. **Agricultural Limestone**, Mosher, Mo., to Lutesville, Jackson, Charleston and Sikeston, Mo. To publish rates on agricultural limestone, carloads (See Note 2) from Mosher, Mo., to Lutesville, Jackson, Charleston and Sikeston, Mo., of 75c, 80c, 85c and 90c per net ton, respectively.

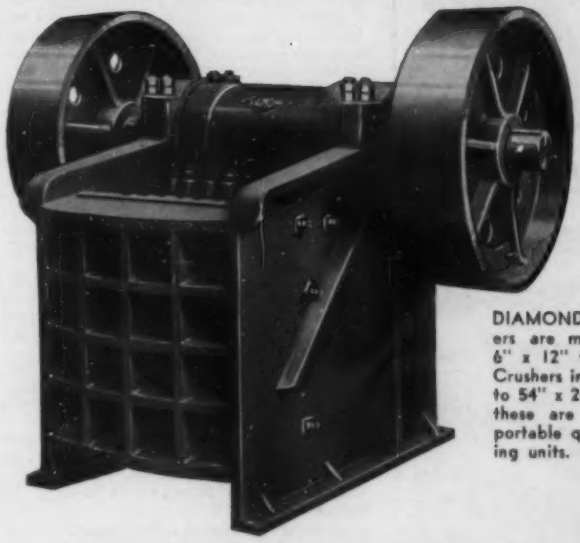
27556. **Vermiculite, Calcined or Roasted**, Canon City, Colo. to Tulsa, Okla. To establish rate of 473c per ton on calcined or roasted vermiculite, carloads, min. wt. 40,000 lb., from Canon City, Colo., to Tulsa, Okla.

27734. **Brucite and dolomite combined (dead burned)**, Narlo, Maple Grove, Millersville and Bettsville, Ohio, to Eagle Pass, Tex., for export to Mexico. To establish rate of 44c per 100 lb. on brucite and dolomite combined (dead burned), C. L., min. wt. 60,000 lb., from Narlo, Maple Grove, Millersville and Bettsville, Ohio, to Eagle Pass, Tex., for export to Mexico.

27764. **Lime**, Sallisaw, Okla., to Soncy, Tex. Establish Amarillo rates 28c min. 30,000 lb., and 22c, min. 50,000 lb. (subject to Ex Parte 148 increase) on lime as described in S. W. L. Tariff 227-D, C. L., min. wt. as provided for in Item 5, from Sallisaw, Okla., to Soncy, Tex.

27777. **Sand and gravel**, Lewisville, Ark., to Shreveport, La. To establish rate of 75c

When You Buy a Crusher
What Should You REALLY Buy?



DIAMOND Standard Jaw Crushers are made in 13 sizes from 6" x 12" to 24" x 36" and Roll Crushers in 6 sizes from 16" x 16" to 54" x 24", and various sizes of these are used in stationary or portable quarry plants and crushing units.

These are the things you should look for and *expect* in the crusher you buy:

1. **A base heavy, rugged and properly reinforced to withstand the hardest crushing operations.**
2. **Pitman and plates (or rolls) carefully made of suitably hard material to give long and satisfactory use.**
3. **Proper *balance* for easiest running and consequent economy of power.**
4. **Delivery of *full* capacity.**
5. **Construction primarily based on the hardest type of crushing.**

Don't buy on claims unless those claims can be thoroughly backed by performance records. And speaking of records, DIAMOND has some recent and very outstanding ones we're anxious to talk about. Either we, or any of our dealers will tell you all about it. In fact, we'd like to consult with you on *any* crushing, screening, conveying or elevating problem you have.

WRITE US or contact our nearest dealer for full details of DIAMOND ROCK, SAND AND GRAVEL EQUIPMENT. Free bulletins on request.

DIAMOND IRON WORKS, INC.
ESTABLISHED 1868
AND THE NAHA MANUFACTURING CO. DIVISION
MINNEAPOLIS, MINNESOTA, U. S. A.

NO MAGIC —ABOUT THE LONG LIFE THAT MOTOR USERS GET WITH WESTINGHOUSE CS MOTORS— SIMPLY SEALED SLEEVE BEARINGS.

...JUST ANOTHER REASON WHY WESTINGHOUSE MOTORS ARE YEARS AHEAD!

J-21234-A

Westinghouse Electric and Manufacturing Co., East Pittsburgh, Pa.

per ton of 2000 lb. on sand (except asbestos and silica sand) and gravel, C. L., min. wt. as provided in Item 60 of SWL Tariff 162-R, from Lewisville, Ark., to Shreveport, La., via St. L. S. W., Shreveport, T. & P.

27821. Phosphate rock and limestone, phosphatic, C. L. Establish 282c net ton. L. & N. Group 1 stations in Tenn. named in Item 55 of L. & N. I. C. C. A-16363, to points on L. & N. in Ky. to which distance from Mt. Pleasant, Tenn.

Construction Contracts For War Work

UNDER WAR-TIME CONDITIONS, the Bureau of Public Relations, War Department has issued bulletins covering contract awards. A tremendous volume of construction is involved in these contracts, and they are being summarized herewith as a matter of general interest to all rock products producers.

Caterpillar Military Engine Co., East Peoria, Ill., for manufacturing plant in Illinois to cost $5,000,000. Supervision is under St. Louis office, Corps of Engineers.

Shreve, Anderson & Walker, Detroit, Mich., for manufacturing plant in Ohio to cost $5,000,000. To be supervised under Detroit office, Corps of Engineers.

Massman Construction Co., Kansas City, Mo., and Hutter Construction Co., Fond-du-Lac, Wis., for manufacturing plant in Wisconsin to cost $5,000,000. Milwaukee office of Corps of Engineers will supervise construction.

Doyle and Russell and Wise Contracting Co., Inc., Richmond, Va., for depot in Virginia to cost $5,000,000. To be supervised by Norfolk office, Corps of Engineers.

Arthur Johnson and Necaro Co., Inc., Long Island City, N. Y., for a depot in Pennsylvania to cost $5,000,000. Supervision is under Baltimore, Md., office, Corps of Engineers.

H. B. Deal & Co., Inc., St. Louis, Mo., for manufacturing plant in Arkansas to cost $5,000,000. Vicksburg, Miss., office, Corps of Engineers will supervise.

Smith, Hinchman & Grylls, Inc., Detroit, Mich., for manufacturing plant in Colorado to cost $5,000,000. To be supervised by Omaha, Nebr., office of Corps of Engineers.

Remington Arms Co., Bridgeport, Conn., for manufacturing plant in Missouri, under supervision of Omaha, Nebr., office of Corps of Engineers. To cost $5,000,000.

United States Cartridge Co., Baltimore, Md., for manufacturing plant in Missouri, to cost $5,000,000. Under supervision of St. Louis office, Corps of Engineers.

E. I. duPont de Nemours Co., Wilmington, Del., for manufacturing plant in Tennessee, to cost $5,000,000. To be supervised by Memphis office of Corps of Engineers.

Wilson and Co., Salina, Kan., for cantonment near Colorado Springs, Colo., to cost $5,000,000. Supervision under Omaha, Nebr., office, Corps of Engineers.

Mills, Thines, Bellman & Nordhoff, Inc., and H. P. Jones & Co., both of Toledo, Ohio, to cost $5,000,000. Supervised by Columbus, Ohio, office of Corps of Engineers.

Holmes and Harver, Los Angeles, Calif., for depot in California, to cost $5,000,000. Construction under supervision of Los Angeles office, Corps of Engineers.

Modjeski and Masters, Harrisburg, Penn., for general depot in Pennsylvania, to cost $5,000,000. To be supervised by Baltimore, Md., office, Corps of Engineers.

Ohio Steel Foundry Co., Lima, Ohio, for manufacturing plant, to cost $5,000,000.

Atlas Powder Co., Wilmington, Del., for manufacturing plant to cost $5,000,000.

Quaker Oats Corp., Chicago, Ill., for manufacturing plant to cost $5,000,000.

Hercules Powder Co., Wilmington, Del., for additional facilities at two manufacturing plants to cost $5,000,000.

Smith, Hinchman and Grylls, Inc., Detroit, Mich., and Toltz, King and Day, Inc., St. Paul, Minn., for additional facilities at manufacturing plant in Minnesota to cost $5,000,000. To be supervised by St. Paul office, Corps of Engineers.

Bates and Rogers Construction Corp., Chicago, Ill., and Chas. W. Cole and Sons, South Bend, Ind., for manufacturing plant in Illinois, to cost $5,000,000. Construction under supervision of St. Louis, Mo., office, Corps of Engineers.

A. Guthrie & Co., Inc., St. Paul, Minn., and Royce J. Tipton, Denver, Colo., for manufacturing plant in Nebraska, to cost $5,000,000. Supervision is under Omaha office, Corps of Engineers.

Chrysler Corp., Detroit, Mich., for manufacturing plant to cost $5,000,000.

Austin Co., Cleveland, Ohio, for manufacturing plant in Texas, to cost $5,000,000. To be supervised by Denison, Texas, office of Corps of Engineers.

Freese and Nichols, Fort Worth, Texas, and McKenzie Construction Co., San Antonio, Texas, for manufacturing plant in Texas, to cost $5,000,000. Construction to be supervised by Denison, Texas, office of Corps of Engineers.

Rust Engineering Co., Pittsburgh, Penn., for manufacturing plant in Kentucky, to cost $5,000,000. To be supervised by Nashville, Tenn. office, Corps of Engineers.

James Stewart Corp., and Fugard, Olsen, Urbain and Neiler, Chicago, Ill., for manufacturing plant in Illinois, to cost $5,000,000.* Supervision by the St. Louis, Mo., office of the Corps of Engineers.

(* The amount of $5,000,000 appears so uniformly that this amount is indicated to be a minimum cost figure.)

For Supplies

Longhorn Portland Cement Co., San Antonio, Texas, 69,500 bbl. of portland cement, War, $142,475.

Southwestern Portland Cement Co., Los Angeles, Calif., 6900 bbl. of cement, War, $13,800.

Security Materials Co., Los Angeles, Calif., 15,340 aggregate-pit run, War, $13,345.

Alpha Portland Cement Co., Easton, Penn., Panama Canal, $316,000.

Concrete Pavement Yardage

AWARDS of concrete pavement for March, 1942, have been announced by the Portland Cement Association as follows:

	Square Yards Awarded During March, 1942
Roads	1,726,677
Streets and Alleys	1,392,282
Airports	3,971,681
Total	7,090,640

Lime Convention

NATIONAL LIME ASSOCIATION has announced that the annual convention will be held at The Homestead, Hot Springs, Va., May 26 to 28, inclusive. There was some doubt as to whether The Homestead would be available for the meetings as the hotel has had as guests the diplomatic and other representatives of the Japanese Government who were interned at the resort by the federal government. The Japanese have been removed for return to their country as soon as American officials in Japan can be exchanged.

One of the papers to be presented at the meetings will be an outline of the Association's extensive research program on chemical lime by R. W. McAllister of Arthur D. Little, Inc., who have been engaged for this work. Charles P. Hoover, author of "Water Supply and Treatment," and an outstanding water works engineer, will discuss the use of lime in this field. Messrs. Voss and Staley will report on their work at the Massachusetts Institute of Technology, including the two-year test results on concrete with additions of lime. Dr. A. R. Midgley of the Vermont Agricultural Experiment Station will present a paper on the "Efficient Use of Lime on the Dairy Farm." Committee C-7 of the American Society for Testing Materials has called a special meeting for Tuesday evening, May 26.

Material Requirements for Mining Machinery A-1-a

W.P.B. HAS GRANTED an A-1-a rating to manufacturers of mining machinery operating under Order P-56-a. This rating is to be assigned to specified percentages of the manufacturers' requirements as listed by them and submitted on Form PD-25-A in connection with the order, and will be in effect during the second calendar quarter ending June 30, 1942.

Effect of the action will be to insure deliveries of specified quantities of materials to the hundred-odd makers of mining and smelting machinery operating under the order, and will provide a steady flow of equipment and repairs to the essential mine and smelting operations providing minerals vital to the war effort.

Manufacturers' requirements for raw, semi-fabricated and fabricated materials totaling about 50 million dollars for the quarter were approved by the Requirements Committee. This represents approximately 30 percent of the total for the year.

J. S. Knowlson, director of industry operations, has implemented the Requirements Committee action by providing for the use of the high ratings for materials.

Control of the ratings will be in the hands of the mining branch. Mining machinery manufacturers affected by the action must report to the branch each Monday all orders they have placed through the previous Saturday.

Amounts of each of the 81 items purchased will be entered against the quota for that particular company and further purchases must cease when the quota is reached. Likewise, the total quota for the industry for any particular item may not be exceeded.

End Dust Trial

THREE SUITS for alleged dust damage against the Santa Cruz Portland Cement Co., Santa Cruz, Calif., have been concluded in the Superior court with the end of the trial which has been before the courts for many months. It was indicated that it will be several months before a decision is handed down by Judge James L. Atteridge. The case will be submitted on briefs to Judge Atteridge for his decision. A total of 95 days for filing of briefs was granted.

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Round Strand
Flattened Strand
Preformed
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High-Capacity Screens
● Designed especially for damp, sticky, and fibrous materials—Speeds up production!
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Completely controls the flow of any size material from Storage Bins, Hoppers or Open-Dump Chutes to Crushers, Conveyors, Screens, etc.
High in efficiency. Low in maintenance and power consumption.

Furnished in sizes to suit your operation. Send full particulars for recommendation.

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OBITUARIES

WILLIAM E. CARSON, president of the Riverton Lime and Stone Co., Riverton, Va., died at his home in Riverton, Va., on March 25, after an illness of several months. Bill Carson, as he was known to a host of friends in the National Lime Association, had been identified throughout his lifetime with the Riverton company, of which he had been president since 1904. Mr. Carson won unusual distinction in his field of industry. He served as president of the National Lime Manufacturers' Association, as it was then called, for some 20 odd years, and was one of its founders. It will be remembered by the old-timers that Mr. Carson edited and printed all the early transactions—the first volume being called "Limelight," now worth its weight in gold. He was also a member of the American Society for Testing Materials and vice-chairman of that society's Committee C-7 on Lime.

During the last war Mr. Carson was chairman of the World War Service Committee on Lime, which functioned under Bernard M. Baruch's War Industries Board for the purpose of insuring maximum cooperation from the lime industry. Both Mr. Carson and his firm were cited for notable contributions to the war effort.

William E. Carson

One of Mr. Carson's greatest honors came in 1936 when, on a trip to England, he was elected a fellow of the British Scientific and Industrial Research Society in recognition of valuable research work in the field of ceramics, with particular reference to lime, lime products, and other cementitious materials.

Mr. Carson is especially remembered in Virginia as the father of the conservation movement in that State. In 1926 he became first chairman of the Virginia Conservation and Development Commission, and he served in this capacity, without pay, until 1934. Under his guidance the Shenandoah National Park, the Skyline Drive, President Hoover's retreat at Rapidan, the Colonial National Monument linking Williamsburg, Jamestown and Yorktown, and the Virginia system of six state parks, were established.

Mr. Carson was born in Ireland, but came to this country with his parents in his childhood and settled in Warren County, Virginia. He is survived by his wife, two daughters and a brother, Charles W. Carson.

ALBERT J. LOVETT, president, treasurer and director of the Grangers Manufacturing Co., limestone products firm, Boston, Mass., died recently at the age of 75. Mr. Lovett was born in Boston, attended private schools

CONTINUE TO DEPEND ON

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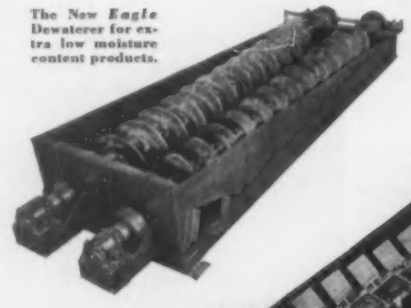
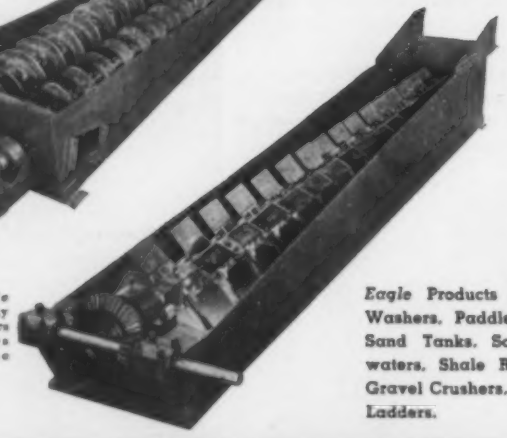
The New *Eagle* Dewaterer for extra low moisture content products.





The New *Eagle* High Efficiency Paddle-Washers for operators with moderate capacities.

In our present emergency *Eagle* stands ready to furnish not only engineering consultation, but also *Replacements* and *Repair Parts* for *Eagle* Equipment which is helping our War Effort directly or indirectly.

If you have a washing problem, call in an *Eagle* Engineer — *Eagle* Washers have been designed to enable you to meet the strictest specifications at a minimum cost for operation and maintenance. Write us.

Eagle Products include Spiral Screw Washers, Paddle Type Log Washers, Sand Tanks, Sand Drags, Sand Dewaters, Shale Removers, Sand and Gravel Crushers, Swintek Screen Nozzle Ladders.

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No Other Screening Medium Offers This
Variety of Perforations

Hendrick Perforated Metal Plate for vibrating and shaking screens is available in
—round, square, hexagonal, slotted, "Squaround" or special openings.
—single corrugations or double corrugations; flat or rolled to any curvature.
—a variety of metals, particularly Hendrick High Carbon, Heat Treated Steel.
If you are not now using perforated plate on your vibrating screens, write for data.

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47 Dundaff St., Carbondale, Pa.
SALES OFFICES IN PRINCIPAL CITIES
PLEASE CONSULT TELEPHONE DIRECTORY
Makers of Elevator Buckets of all types, Mitco Open Steel Flooring, Mitco Shur-Site Treads and Mitco Armorgrids. Light and Heavy Steel Plate Construction.

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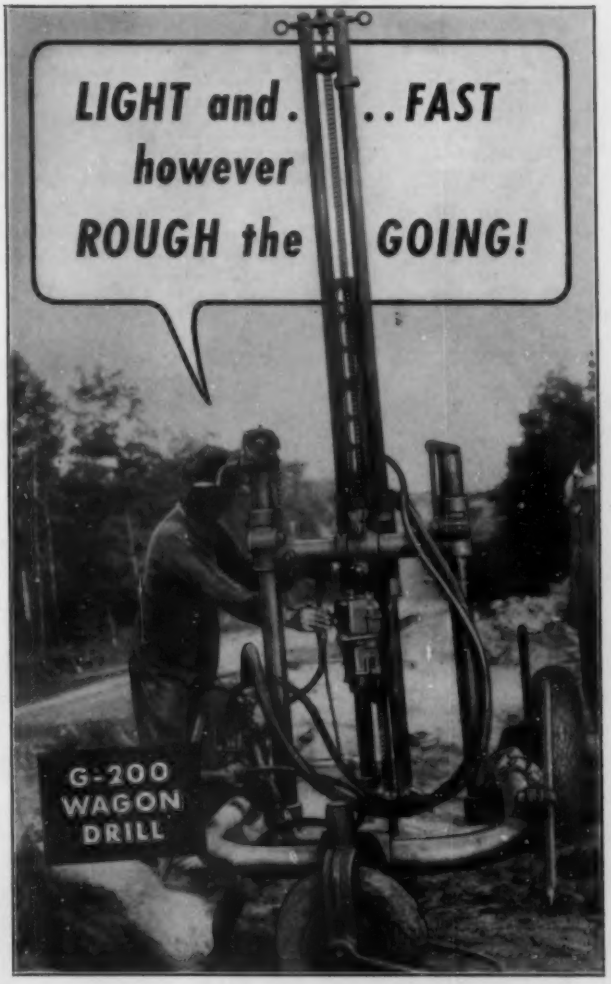

Greater mobility over rough ground and more universal application result from the *outstanding mounting* of CP Light Wagon Drills.

The light-weight tubular drill carriage frame, and combination of drill and mounting, permit fast, easy, one-man operation of powerful CP drifter type drills.

Three-wheeled mounting of roller bearing wheels (readily turned at right angles) . . . hand operated hoist . . . drill carriage accommodating a 6' steel change and handling of 18 to 30-foot steels . . . are some of the reasons why G-200 Wagon Drills fill the gap between hand-held sinkers and heavier types of wagon drills.

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LIMESTONE PULVERIZERS

Built Stationary or Portable

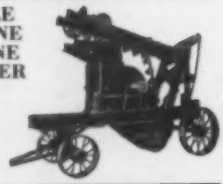
Crushes Large Stone to 2" minus Down to Agricultural Dust

Adjustable (8 Sizes)

Cross Section View of Pulverizer

PORTABLE TWO-IN-ONE LIMESTONE PULVERIZER AND ROCK CRUSHER

Adjustable to Produce Road Rock or Agricultural Lime Dust



For Secondary Crushing

DOUBLE ROLL CRUSHERS

From 18" to 40" Diameter

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GRUENDLER CRUSHER & PULVERIZER CO.

2920-26 N. Market St., St. Louis, Mo.

and Boston public schools, and was graduated from Chauncy Hall in 1885. In 1888, he became associated with his father in a law firm. He was elected a director of the Grangers Co. in 1917 and became president and treasurer in 1919.

HARRY W. LORESCH of Pittsburgh, Penn., a pioneer in the concrete burial vault industry, passed away recently at the age of 62.

GEORGE H. ELLIOTT, vice-president of the Whitehall Cement Mfg. Co., Philadelphia, Penn., died recently of a heart attack at the age of 56.

CHARLES A. RICHEY, a former owner of the Richey Sand and Gravel Co., Louisville, Neb., which later was sold to the Lyman Sand Co., and became the Lyman-Richey Sand and Gravel Co., Omaha, Neb., died recently at his home in Dallas, Texas, at the age of 70.

EDWIN C. ECKEL, chief geologist of the Tennessee Valley Authority since 1933, and author of *Cement, Lime and Plaster*, died at his farm near Knoxville, Tenn., his birthplace, at the age of 67. Mr. Eckel attended the New York University Engineering School, receiving his B.S. degree in civil engineering in 1896. For several years he was with the U. S. Geological Survey. During the first World War he served in France as Captain and later as Major of the Engineering Corps.

HARRY P. DAVIS, general superintendent of the cement plant at San Jose, Calif., of The Permanente Corp., was killed recently in an automobile accident.

HARRIS JAMES GRAM, vice-president of the Limestone Products Co., Menominee, Mich., at the time of his retirement several years ago because of ill health, died recently at the age of 55.

AARON THOMAS BOWERS, superintendent of the Ready-Mixed Concrete and Supply Co., Nashville, Tenn., passed away recently at the age of 55.

CHARLES C. BYE, former vice-president of the Warner Co., Wilmington, Del., died recently at the age of 80. Mr. Bye was born in Wilmington in 1862 and started his business career in 1879 as an office boy in the Warner Co. He was connected with that firm throughout his entire business life, becoming secretary and a director, and later, vice-president. He retired about 10 years ago. He was also a director of the American Lime and Stone Co., Bellefonte, Penn.

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ELVERITE, for wear resistance

ADAMANTINE, for abrasion-resistance, great strength and machinability

HEAT-RESISTANT CASTINGS

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MATERIAL HANDLING
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A complete line of improved units to do that handling or reducing job at the lowest possible cost. Conveyors, elevators, feeders, screens, crushers, portables, idlers, dryers, coolers, chains of all kinds . . . all designed to save you money in handling material.

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Swing Hammer PULVERIZER

Its wide crushing range makes it serve the purpose of two or more other types of crushers. Roller bearing equipped. Write for Bulletin.

Brooks EQUIPMENT & MFG. CO. KNOXVILLE TENNESSEE

SUPER-LOY

WOVEN WIRE SCREENS

LUDLOW-SAYLOR

WIRE CO. ST. LOUIS

PRICES BID
Contracts Let

ST. LOUIS, MO.: The War Department has awarded contracts for the Jefferson Barracks, as follows: Columbia Quarry Co. for stone and rip-rap at price of $6,754; General Material Co. for ready-mixed concrete at price of $4,777.

•

WASHINGTON, D. C.: The War Department has awarded contract to Alpha Portland Cement Co. for supplying portland cement for a Florida air base at a price of $3,174.

•

TOPPENISH, WASH.: The City Commissioners have awarded a contract to Elliott & Co. for 2000 cu. yd. of gravel at 70c and 200 cu. yd. of another grade at $1.38 a cu. yd. Cecil Myers will haul the gravel for 60c a cu. yd.

•

SALT LAKE CITY, UTAH: The War Department has announced the purchase of 50,000 bbl. of portland cement at $2.25 per bbl. from the Portland Cement Company of Utah for the $30,000,000 ordnance depot in Utah.

•

SEBRING, OHIO: Harry Maherman, contractor, of Farmdale, Ohio, has received contract award for furnishing 600 tons of No. 6 slag at $2.09 per ton for paving Ohio avenue. J. H. Jones Co. submitted a price of $2.11 per ton.

•

WASHINGTON, D. C.: The War Department has announced orders were placed for materials for the Wolf Creek Dam on the Cumberland river in Kentucky, as follows: Louisville Cement Co., Louisville, Ky., portland cement, $1,093,920; Alpha Portland Cement Co., Easton, Penn., portland cement, $1,710,200.

•

MARYVILLE, MO.: 30,000 tons of crushed limestone is being delivered from the quarry and spread on designated farm areas at $1.99 per ton by use of privately owned trucks and contractor leased spreader boxes. Cost of delivery exclusive of spreading is $1.69 per ton, and farmers may take the product from the quarry at a cost of $1.35 per ton.

•

VANCOUVER, WASH.: The Elkins Sand & Gravel Co. submitted the low bid to the Bonneville power administration for supplying 500 cu. yd. of fine and 800 cu. yd. of coarse gravel

MODEL 51

TRADE MARK
KEYSTONE
REGISTERED U. S. PATENT OFFICE

BLAST HOLE DRILL

CRAWLER MOUNTED AND STABLE IN TRACTION—*Short moves can be made with derrick standing.*

The outstanding feature of this modern rock drill is its welded and riveted sturdy frame. Pounding down six inch holes in hard rock, gives a rock drill a lot of jolts—and that is why KEYSTONE engineers employed a combination of both welding and riveting to give it a rugged and durable frame foundation.

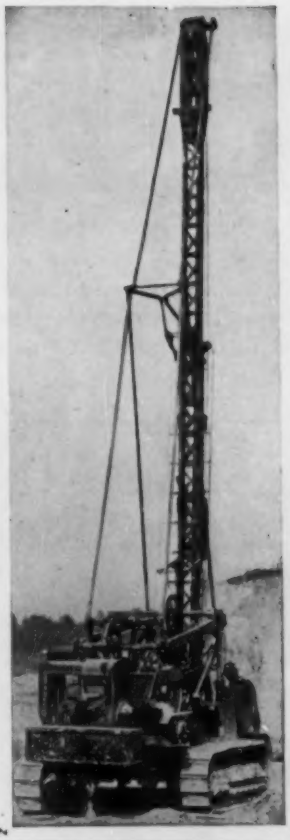
The working mechanism of the Model 51 crawler traction drill is likewise made to take rough service. Shafts and anti-friction bearings are oversized. The length and character of the stroke are adjustable to give greatest efficiency.

You can be sure of getting a superior piece of equipment that will give you dependable performance for years if you select a KEYSTONE Blast Hole Drill.

You will want to know more about it.

Write for Bulletin BD-1141.

KEYSTONE DRILLER CO.
Beaver Falls, Penna.

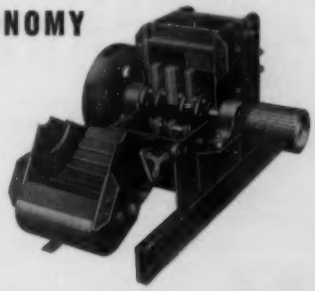


For PERFORMANCE and ECONOMY

NEW HOLLAND Model 20 LIMESTONE PULVERIZER

● Features include Boilerplate Steel Construction, Ball Bearings, Adjustable Breaker Plate, Adjustable Swinging Hammers, Reversible Concaves, Replaceable Housing Liners, and Tramp Iron Pocket.

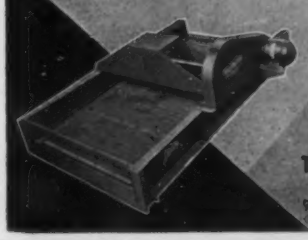
WRITE DEPT. P FOR COMPLETE DETAILS



NEW HOLLAND NH MACHINE CO.
NEW HOLLAND, PENNSYLVANIA

THE Leahy HEAVY DUTY

No-Blind VIBRATING SCREEN with TRI-VIBE —for Fine Mesh Screening



PREVENTS BLINDING
SCREENS FASTER AND BETTER
SAVES ON POWER

Tri-Vibe Equipped Type C Leahy Screens are guaranteed to operate with only ⅝ H.P. and an annual maintenance less than 1% of purchase price.

THE Leahy HEAVY DUTY Vibrating Screen

Write for bulletin No. 14-H

THE DEISTER CONCENTRATOR COMPANY
The Original Deister Co., Est. 1906
915 GLASGOW AVE. FORT WAYNE, IND.

FARREL BACON CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants.

Engineering Service

EARLE C. BACON, Inc.

17 John St., New York, N. Y.

at the combined average price of 90c per cu. yd.; and the Olympic Portland Cement Co., Seattle, submitted the low bid for 1200 bbl. of portland cement at $2.00 a bbl. for the same project.

CARROLLTON, OHIO: The Standard Slag Co., Youngstown, was awarded contract for furnishing 1000 cu. yd. of slag at $1.00 per cu. yd., plus freight, to be used on county roads 29 and 20 and other roads.

MILLERSBURG, OHIO: Killbuck Sand & Gravel Co., Killbuck, received contract for furnishing 2700 cu. yd. of gravel at a price not to exceed 45c per cu. yd., to be used on county road No. 51.

FOSTORIA, OHIO: The county commissioners received the following bids for furnishing stone and ready-mixed materials for county road improvements during the coming year: National Lime and Stone Co., Findlay, $1 per ton net at quarry for No. 1, 2, 7 and 467 stone; $1.10 per ton for No. 3, 34, 4 and 46 stone; $1.20 per ton for No. 6 stone; and $1 for sand. Basic Refractories, Inc., Maple Grove, 90 cents per ton for No. 7 stone; $1.20 per ton for No. 6 stone; $1 per ton for No. 1 and No. 2 stone; and $1.10 per ton for mixed aggregate. The France Stone Co., Toledo, 90 cents per ton for No. 7 stone, $1 per ton for No. 1, 2, 8, 9, 11 and 467 stone; $1.10 per ton for No. 3, 3-A, 4, 34 and 46 stone; $1.20 for No. 6 stone; and $1.70 per ton for 6-B and 9-C stone.

TWO RIVERS, WIS.: Manitowoc County Agricultural conservation committee has reported that 750 tons of ground lime were sold to farmers in Manitowoc county in the past year. Cost of the lime was $1.80 a ton delivered on the farm and a credit of $2.00 per ton is allowed for application of the lime under the AAA farm program.

HOUSTON, TEXAS: United States Maritime Commission has let a contract to San Jacinto Shipbuilders, Inc., for the construction of five 54-x350-ft. experimental concrete bulk cargo barges. The approximate cost is $685,000 each, including cost of yard.

DENISON, TEXAS: Lone Star Cement Corp. and Trinity Portland Cement Co. submitted identical bids on 60,000 bbl. of portland cement for construction of runways at an assembly plant. The bids included total figures of $118,200 for cement in bulk, $130,200 in paper sacks and $145,200 in cloth sacks.

BOTH ENDS are Vulnerable to BURN-OUTS

The use of PYRASTEEL Kiln Ends is not by any means confined to the *discharge end*.

Such high temperatures are frequently encountered at the *feed end* of the kiln, as to make the use of

PYRASTEEL SEGMENTS

the most practical method of preventing *burnouts* and interrupted operations.

There are many PYRASTEEL installations on the *feed end* and on the *discharge end* of rotary kilns . . . also where both the feed and discharge ends are provided with PYRASTEEL Segments. All are giving satisfactory results.

Write for Bulletin on this Heat-Resisting Alloy

CHICAGO STEEL FOUNDRY COMPANY

KEDZIE AVE & 37TH ST

PYRASTEEL for high temperatures — CHICAGO Makers of Alloy Steel for 30 Years — EVANSTEEL for strength

New Incorporations

Hollywood Sand and Gravel Co., Inc., Memphis, Tenn., has been granted a charter to deal in sand, gravel, etc. Capital stock $6000. Incorporators are R. G. Draper, Mary M. Phillips and H. J. Steuterman.

United Concrete Form Products Co., Inc., Dover, Del., has been incorporated as a general agency, with a capital of 200 shares, no par value. Incorporators are R. F. Lewis, L. H. Herman, W. T. Cunningham, all of Wilmington, Del.

C. & F. Concrete Block Corp., Queens, N. Y., has been organized for the construction of cesspools and sewers. Capital stock 3 shares, no par value. Freeman & Hyman, 155 Jamaica Ave., Jamaica, N. Y., are the agents.

National Mica Corp., Newark, N. J., is the name of a new company with a capital of 2500 shares. Alfred C. Clapp is the agent.

Stewart Lime Quarries, Columbus, Ohio, has been granted incorporation papers with a capital of $25,000. Incorporators are Louis Stewart, Roy Stewart and Robert H. Stewart.

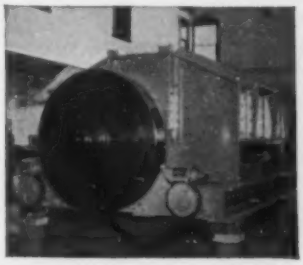
Consolidated Concrete Corp., Newark, N. J., has been incorporated with a capital of 1000 shares. Louis H. Hollander is the agent.

Aubuchon Silica Mining Co., Crystal City, Mo., has received incorporation papers. Cobbs, Logan, Roos & Armstrong, Missouri Valley Trust Bldg., St. Louis, Mo., are the attorneys.

Mica Corporation of America, Dover, Del., has been incorporated with a capi-

ANOTHER "PENNSYLVANIA" REVERSIBLE HAMMERMILL

ready to "go on the line" in a new Cement plant designed for top efficiency in every Department.



- Major crushing by smashing impact
- Automatic hammer turning
- Product sizing control, and wear compensation, assured by Duplex cage adjustments
- Reduced power demand
- Sharply cut maintenance cost

are some of the outstanding advantages which this REVERSIBLE Hammermill will provide in the Secondary Preparation for modern Raw Side Grinding Mills.

Send for Bulletin No. 1030, and PUT YOUR REDUCTION PROBLEMS UP TO US.

PENNSYLVANIA CRUSHER COMPANY

Liberty Trust Bldg.
PHILADELPHIA, PA.

RYERSON CERTIFIED STEELS

10 Strategically-Located Steel-Service Plants

Principal products include—Alloy Steels, Tool Steels, Stainless Steel, Hot Rolled Bars, Hoops and Bands, Beams and Heavy Structurals, Channels, Angles, Tees and Zees, Plates, Sheets, Cold Finished Shafting and Screw Stock, Strip Steel, Flat Wire, Boiler Tubes, Mechanical Tubing, Rivets, Bolts, etc. Write for Stock List. Joseph T. Ryerson & Son, Inc. Plants at Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

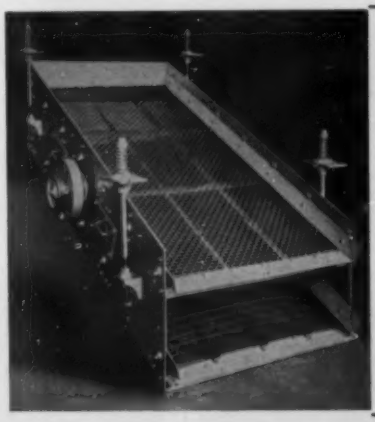
PERFORATED METAL SAND AND GRAVEL SCREENS

Manufactured exactly to your specifications

Any size or style screen, in thickness of steel wanted with any size perforation desired.

We can promptly duplicate your present screens at lowest prices

CHICAGO PERFORATING CO.
2437 West 24th Place
CHICAGO, ILLINOIS
Canal 1459



Denver-Dillon Vibrating Screen

The Denver-Dillon Vibrating Screen has been proved by over four years of service in numerous industries. Operators report definite reduction in screening costs. "Floating circle" principle requires less than half of the average power of other means of screening. Write today for new Bulletin No. 83-B3.

Denver Equipment Co.
1400 Seventeenth St.
Denver, Colorado
New York, N. Y., 50 Church St.
Salt Lake, Utah, McIntyre Bldg.
Chicago, Ill., 1965, 69 W. Wash.
Toronto, Ont., 45 Richmond St.
Mexico, D. F., Edificio Jalisco

McLANAHAN EQUIPMENT for ROCK—SAND—GRAVEL

Single and double roll and jaw crushers, hammer mills, super dry pans, steel log washers and scrubbers, sand dregs, revolving and vibrating screens, elevators, conveyors, dryers, jigs, hoists. Complete portable, semi-portable and stationary crushing, screening and washing plants for different capacities of any materials.

McLanahan & Stone Corporation
Established 1835
Hollidaysburg, Pennsylvania

HAYWARD BUCKETS

USE RIGHT BUCKET FOR THE JOB

Hayward makes all four—clam shell, drag-line, electric motor, orange peel. A Hayward recommendation is unprejudiced.

THE HAYWARD COMPANY
202-204 Church Street
New York, N. Y.

NAT-ALOY WIRE CLOTH

"Nat-Aloy" Lock Crimp Meshes

Assure Accurate Separations

Abrasive resistant, non-crystallizing. Immediate shipment from stock . . . all widths . . . all meshes . . . attractive prices.

Send for our detailed catalog No. 55.

NATIONAL WIRE CLOTH CO., Inc.
252-270 W. FAIRFIELD AVE. ST. PAUL, MINN.

WILFLEY centrifugal SAND PUMPS

for Slurries, Sand Tailings, Slimes, Acid Sludges

Save Pumping Cost

Continuous operation without attention for long periods. Stuffing box, stuffing, gland water ALL eliminated. Close clearances maintained by easy slippage seal adjustment. Heavy pumping parts of material best suited for YOUR particular problem. Complete engineering service. Prompt shipment of parts. The most efficient and economical pump you can buy. *Write for Complete Catalog*

A. R. WILFLEY & SONS, Inc., Denver, Colo., U. S. A.
NEW YORK OFFICE: 1775 BROADWAY

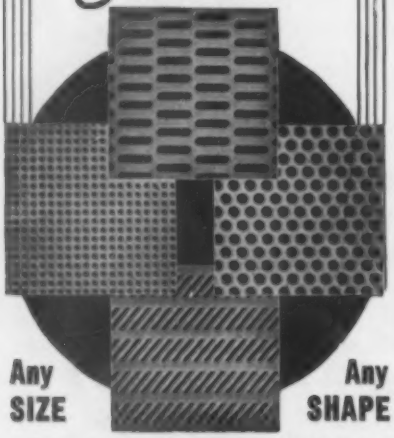
SECO
VIBRATING SCREENS

From Coast to Coast in the U. S. A. as well as in other countries, SECO Screens have been steadily building an enviable reputation for the efficient sizing and grading that is so necessary in meeting today's rigid specifications on stone sizes.

SECO'S "control of motion" is proving itself in nation-wide use — year in and year out.

Screen Equipment Co.
INCORPORATED
BUFFALO, N.Y.

PERFORATED METAL
Screens



Any SIZE Any SHAPE

Any METAL Any PERFORATION

For vibrating, shaking and trommel screens.

Excellent material and workmanship for good screening results.

The Harrington & King Perforating Co.

5650 Fillmore St., Chicago—114 Liberty St., N. Y.

tal of 5000 shares of stock, no par value. Incorporators are Adrian N. Balstra, D. E. Newman, and M. L. Cianci, New York.

Manufacturers' News

Link-Belt Co., Chicago, Ill., announces the re-election of Alfred Kauffmann, B. A. Gayman, and J. Reece Lewis as directors of the company for the full term of three years. Two new directors were also elected, namely, Clarence Tolan, Jr., president of Dodge Steel Co., Philadelphia, for the full term of three years, to succeed Wellington Wells; and William C. Carter, executive vice-president, Link-Belt Co., Chicago, for a term of two years, to succeed George L. Morehead.

The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J., announces that J. H. Matthews, assistant general manager of The Manhattan Rubber Mfg. Division, Passaic, N. J., and Mr. Cilley, assistant general manager of the United States Asbestos Division, Manheim, Penn., have been elected members of the Board of Directors of the company.

The Cummins Diesel Engine Corp., of New York, announces the appointment of Charles D. Cavett as advertising and sales promotion manager.

Wickwire Spencer Steel Co., New York, N. Y., advises that Carl I. Collins, elected on March 26 to the Board of Directors of the company, will be named executive vice-president at the next meeting of the Board. Mr. Collins is resigning his position as manager of operations of the Worcester district of the American Steel and Wire Co. to join Wickwire Spencer Steel Co.

Allis-Chalmers Manufacturing Co., Milwaukee, Wis., has announced the resignation of W. C. Buchanan, president, because of ill health. Mr. Buchanan will retain his membership on the board of directors and executive committee. Walter Geist, formerly vice-president, has been elected executive vice-president.

General Electric Co., Schenectady, N. Y., has appointed Allen E. Bailey, Jr., as manager of sales, and William D. Cockrell as engineer of the new electronic control section which has just been organized. Mr. Bailey will report to G. R. Prout, manager of the industrial control division, and Mr. Cockrell to E. H. Alexander, engineer of that division.

American Pulverizer Co., St. Louis, Mo., regrets to announce that Edwin E. Elzemeyer, president of the company, passed away recently.

The Marion Steam Shovel Co., Marion, Ohio, announces the appointment of J. A. Riley, district manager of its New York office, as export manager, with headquarters in the Graybar Building, 420 Lexington Ave., New York, N. Y. Mr. Riley will still remain district manager.

New Holland Machine Co., New Holland, Penn., has purchased the manufacturing and selling rights for the Stover limestone pulverizer, tractor saw attachments, saw frames, drag saws, mandrel sets, tank heaters, hog troughs, and ensilage cutters, all formerly manufactured by the Stover Manufacturing and Engine Co., Freeport, Ill.

Robins Conveying Belt Co., Passaic, N. J., has announced that Alfred S. Otten is relieved of his former duties as advertising manager in order that he may handle important productive assignments in connection with the war work now being done by the company. He will also be responsible for both the sales and production end of the screen cloth department at Passaic. John M. Lupton, formerly assistant advertising manager, has been promoted to the position of advertising manager.

Worthington Pump and Machinery Corp., Harrison, N. J., regrets to advise that Edward T. Fishwick, senior vice-president and director, died on March 15 at his home in Glen Ridge, N. J. Mr. Fishwick had been with the Worthington organization for 49 years, having started with the corporation at its Cincinnati Works. He was also president and director of the Worthington-Gamon Meter Co. of Newark, N. J., and was formerly head of the Diesel Engine Manufacturers Association.

Peerless Pump Division of the Food Machinery Corp., Los Angeles, Calif., and Canton, Ohio, has acquired the Sterling Pump Corp., Hamilton, Ohio, and Stockton, Calif.

Gar Wood Industries, Inc., Detroit, Mich., has elected the following managers as vice-presidents of their divisions: W. H. Hammond, sales manager of the hoist, body, and tank divisions and director of branches; J. B. Haile, general manager of the road machinery division; G. E. Robinson, manager of the winch division. These newly elected vice-presidents will continue their duties as managers of their divisions.

Mine Safety Appliance Co. of Canada, Ltd., Pittsburgh, Penn., which is the largest commercial producer of approved safety equipment in the world, has opened a new office in Toronto where the company's general manager, R. Morris, will make his headquarters.

Continental Gin Co., Birmingham, Ala., has been awarded the U. S. Navy Ordnance flag and the Navy "E" pennant as a recognition of outstanding effort in the production of ordnance materials vital to national defense.

The Farrel-Birmingham Co., Ansonia, Conn., has awarded the general contract for the construction of its new plant in northern New York to the Turner Construction Co. Plans provide for a one-story structural steel, brick and glass manufacturing building, 603- x 203-ft., with three crane-ways, together with an office building, power house and cafeteria.

Wickwire Spencer Steel Co., New York, N. Y., has announced the appointment of S. L. Bates as Buffalo district sales manager, with offices in the Rand Building, Buffalo, N. Y.

The Buda Co., Harvey, Ill., has placed Norman E. Donnelly, district manager, in charge of their Washington office. He will be assisted by V. D. Lake, sales engineer. This transfer has been made due to the entire former staff of the Washington office joining the colors.

Hercules Powder Co., Wilmington, Del., has announced that its advertising program has been keyed to the times by the introduction of the slogan, "Toward V-Day" in its forthcoming advertising. "Can your research help us?" is the keynote which will run through the campaign.

Marmon-Herrington Co., Indianapolis, Ind., has added W. H. Klett to its export staff. Though a native-born American, Mr. Klett has had many years experience with the Spanish speaking peoples. He was educated in Mexico and did not really learn the English language until he returned to the United States as a young man. His automotive experience comprises the management of a large distributing firm in Mexico City and many years as district manager in Central and South America, as well as in the United States, for several prominent automobile manufacturers.

The Ironton Fire Brick Co., Ironton, Ohio, has elected the following officers: E. F. Myers, president, treasurer and general manager; C. E. Bales, vice-president; W. P. Lewis, vice-president; Wm. D. Lewis, secretary.

Classified Advertisements

POSITIONS WANTED — POSITIONS VACANT Set in six-point type. Minimum $1.00 each insertion, payable in advance.

INFORMATION—Box numbers in care of our office. An advertising inch is measured vertically in one column. Three columns, 30 inches to the page.

CLASSIFIED—Displayed or undisplayed. Rate per column inch, $5.00. Unless on contract basis, advertisements must be paid for in advance of insertion.

AVAILABLE NOW—TO HELP YOU SPEED UP

JUST PURCHASED

1—22x50 "Champion" Jaw Crusher.
1—No. 1020 Good Roads Reduction Jaw Crusher.
1—Kennedy "25" Ball Bearing Gearless Crusher, for fine crushing.
2—Allis-Chalmers Centrifugal Vibrating Screens, 4'x8'.
1—3 Compartment Butler Bin with 3-beam 2 yd. Weighing Batch Hopper.
10—16" LINK BELT CONVEYORS, ANTI-FRICTION TROUGHING IDLERS, VARIOUS LENGTHS, STEEL FRAME, APPROX. 1000 FT. USED IN OIL REFINERY.
1—Belt Conveyor 24" x 153'.
1—Belt Conveyor 30" x 146'.
1—Belt Conveyor 20" x 52'.
1—Belt Conveyor 24" x 170'.
1—Belt Conveyor 20" x 28'.
3/60/220 volt Electric Motors for driving above.

1—142 H.P. Buda Diesel Industrial Power Unit.

ROTARY DRYERS

Direct Heat: 5'x30', 6x40, 6x50, 6x60, 7x60 single shell.

VIBRATING SCREENS

2 Sets of Type 20 double deck 4x5' Tyler Hummers; 4x5' 2-deck; 4x7' Leahy 2-deck, motor driven; 3x10' Kennedy, 3-deck; 3x5' Kennedy, single deck.

LIME HYDRATORS

Weber Sr. Type, made by Arnold & Weigel with No. 1 Raymond Bros. Lime Separator; also Kritzer.
One Complete Hydrated Lime Plant.

GYRATORY CRUSHERS

1—15" Telsmith, No. 7½.
1—20" Superior McCully.
1—27" Gates, with 100 H.P. A.C. motor.
1—No. 410-TZ Traylor, 10" feed, can be set to ½".
3—Kennedy No. 15, No. 25, No. 40.
2—Telsmith No. 2-H and No. 3-F.
1—No. 40 Telsmith, 5" feed, ⅞ discharge; also No. 40 with 40 H.P. A.C. motor.
1—13" Allis-Chalmers Superior McCully.
1—15" Austin.

JAW CRUSHERS

1—24"x36" Farrel, Type 15-B.
1—24x50" Champion.
1—24x30" Carroll, all steel.
1—15x38" Wheeling.
1—8x36" Universal.
1—13x30" Buchanan.

STEEL STORAGE TANKS

Horizontal: 5—10x26', 10x36', 8x24'.
Vertical: 10x30', 10x25', 2—8x30', ⅜" plate, 1—40,000 gal. Hemispherical bottom, closed top, 19' dia.

AIR COMPRESSORS

2—Electric driven National Brake, 99 lbs., 300 CFM, incl. 54 H.P. 3/60/550 v. motors.
1—1200 CFM Worthington feather valve, with 3/60/2200 v. syn. motor.
1—3440 CFM Sullivan WN-4, with 500 H.P., 3/60/2300 v. syn. motor.

CRUSHING ROLLS

Single Roll: 30x36" Jeffrey; 18x24", 21x40" and 21x50" Pennsylvania.
Double Roll: 42x16" Allis-Chalmers Anaconda type, at Waukon, Iowa. 36x16" Traylor and Allis-Chalmers.

BALL, ROD AND TUBE MILLS

Tube Mills: 6'6"x22' Hardinge, straight side, iron lined with 300 H.P. direct connected A.C. motor.
2—5'x20' Bonnot silex lined Tube Mills with steel gears and steel heads.
2—6'6"x20' Smidth, silex lined.
1—5'22' Allis-Chalmers, iron lined.
1—6'x9' Allis-Chalmers, iron lined.
4—Hardinge Conical Mills, 6'x16", 8'x30" all iron lined; 6'x22" silex lined.

CONSOLIDATED PRODUCTS CO., INC.
15-16-17 PARK ROW — *Shops and Yard at Newark, N. J., cover eight acres.* — NEW YORK, N. Y.

CONCRETE EQUIPMENT

Erie 100 ton 3 compt. bin with weigh batcher.
B.K. 250 bbl. Cement Bin complete.
Various Floor Hoppers, Britches and Tremie.
Blaw Knox complete central mixing plant.
Steel bin, 75 yds., single compt., sand and gravel.
200 ton rock storage bin, steel, heavy construction.
Fuller Kinyon bulk cement unloader, portable.
Fuller C40 rotary air compressor, electric.
Ransome Dual drum paver 27E.
Koehring 27E Paver, boom and bucket.
Ransome 28-S 1 yd. stationary mixer, elec.
Barber Green Model 62 bucket loader, cats.

SPECIALS!!!

15" x 30" Traylor Jaw Crusher.
3—30,000 gal. Asphalt Tanks.
2—Ruggles-Cole Rotary Driers 7'x25'.
Sullivan Air Compressor 1051 cu. ft. F.-Morse oil engine.
Allis-Chalmers cent. pump, electric, 3500 GPM.
2—Asphalt Mixing Kettles, 5800 gals. each.
Steel building 54' x 110' x 43'.
Sullivan Air Comp. 110 cu. ft., gas, port.
Road Forms 8000 ft., 10" x 6", 9" x 8", 8" x 8".
Steel Pipe 14,000 ft. 2", 2½", 3".

BUCKETS—STONE SKIPS

22—Steel stone skips, 2 to 3 yds.
1 yd. Hayward rehandling clamshell.
1 yd. Hains rehandling clamshell.
2—½ yd. Hains rehandling clamshell.
¾ yd. Hains rehandling clamshell.
1 yd. Hayward orange peel, 4 leaf.
⅜ yd. Hayward orange peel, 3 leaf.

SHOVELS—CRANES

Marion Model 125 Elec. Shovel, 3½ yds.
Bucyrus Erie 43B Diesel Shovel, 1¾ yds.
Bucyrus Erie Model 1030 electric tunnel shovel.
2—Marion Steam shovels, 1½ yd. capacity.
No. 50-B Bucyrus Erie electric shovel, 2 yds.
Bucyrus Erie 50B Steam Shovel, 2 yds.
Northwest Model 105 ¾ yd. gas crane.
Link-Belt Crane, gas, 50' boom, 1 yd. cap.
Brownhoist Crane, gas, 40' boom, 1 yd. cap.
Osgood Conqueror Gas Shovel, 1½ yds.

LOCOMOTIVES—CARS

2—Vulcan 6 ton, gas, 36" gauge.
1—Whitcomb 4½ ton, gas, standard gauge.
2—Porter 13 ton, Saddle Tanks, steam, 36" gauge.
8—3 yd. V type 36" ga. side dump cars.

CRUSHERS

Gyratory crushers: K.V.S. 30, 37-S, 49; Telsmith 32, 8A, 8B; Traylor 8"; McCully 12", 8", 6".
Jaw: 6x12, 9x16, 10x20, 12x26, 13x30, 15x30, 16x32, 36x48.

RICHARD P. WALSH CO.
30 CHURCH STREET — NEW YORK

FOR IMMEDIATE SALE

D-13000, 6 cylinder, Caterpillar Diesel Engine, No. 5E 2234, including 150 gallon fuel tank. $2500.00.
KOP 4 cylinder, Cummins Diesel Engine, No. 13198, 141 peak horse power at 800 RPM, complete with all standard equipment plus starting equipment. $5,125.00.
PD-40 International Power Unit with clutch, welded base, and electric starter. $1200.00.
Sullivan portable air compressor, 220 cubic feet, No. 12247, mounted on 4 steel wheels. $500.00.
No. 6, Style "K" Gates crusher, No. 6230. $1750.00.
American Type C, 16"x30" Pulverizer, No. 1545. $750.00.
Farrell Jaw Crusher, 36"x18", No. B-5116. $850.00.
No. 1 Jumbo Williams Hammer Mill, 30"x15", No. 8556. $550.00.
Continuous bucket elevator, belt 16" wide, 105 feet long, with 95 buckets each 10"x8"x11¾". Price $600.00.
Continuous bucket elevator, belt 18" wide, 100 feet long, with 62 buckets each 16"x12"x17¾". Price $600.00.
Revolving Screen, 60 inch diameter x 24 feet long. $1300.00.
Revolving Screen, 48 inch diameter x 12 feet long. $800.00.
Howe Truck Scale, No. 1110106, capacity 33000 pounds. $350.00.
Fairbanks Self Contained Ten Ton Capacity Truck Scale. No. 11926. $160.00.
30 Ton 4 compartment steel Gruendler Jack leg bin. $600.00.

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Telephone Lucerne 0145

CRUSHERS

GYRATORY: 42" Gates K. 20" Superior McCully (Like new). 20" Superior McCully, Gates Nos. 12, 10, 9, 8, 7½, 6, 5, 4, 3, 2, 1 (75 avail.) Telsmith Nos. 4, 5, 6, 8C, 9 & 16. Also many Austins, Kennedys and Traylors, many sizes.
JAW TYPE: Traylor 60x34, 48x60, 42x48, 24x72. Superior 84x66 & 24x36. Buchanan 30x42. Farrel 60x42, 30x36, 24x36, 18x36, 12x24. Good Roads 1030. Acme 24x40. Misc. 7x12, 9x16, 8x30, 8x24, 12x24, 9x36, 9x30, 15x36.
REDUC. TYPE: Kennedy Nos. 25, 37 & 40. Telsmith 3-F & 40. Traylor 36" TZ, 8", 10", 12". Super. McCully 6" & 10". Newhouse 5, 7 & 10". Symons Cone & Disc Ty. 2' to 4'.
ROLLS: Allis-C. 12½x12, 36x10, 40x15, 54x24 & 72x36. Fairmount 36x40 & Jeffrey 24x24 to 36x54 single roll. Cornish 36x14 & 42x16, Etc., Etc.
HAMMERMILLS: Williams No. 1, 2, 3, 4, 6 & 9. Jeffrey 36x18 & 26x42. Day Nos. 30 & 40., Etc.
MILLS: Kennedy Ball 4x6, 5x6 & 5x8. Marcy 8x6 & 10x3. Hardinge 6'x3', 6'x20' & 6'x9'. Misc. Tube Mills 5' & 6' x 22'. Sturtevant Ring Roll, Raymonds, Kents, Fuller-Lehigh, Etc., Etc.
CRUSHING PLANTS: No. 65 Diamond No. 22 Pioneer 8x24, 1030 Good Roads, 9x40 Austin-Western, 9x36 C.R.

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CLAMSHELL BUCKETS—¾, 1, 1¾ and 2 yds. rehandling type.

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1—Bucket Elevator with steel buckets 14 x 14 x 7" on heavy duty single chain complete with all chains, sprockets, etc., 40' centers mounted on wood frame.

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10—20 yd. capacity Western all steel standard gauge air dump cars.
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All standard makes Size No. 4 openings 8 x 30 to Size 21 openings 42 x 134".

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8 x 16 up to and including 48 x 60.

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1—Traylor 42" x 48" capacity per hr. 260 tons at 8" or 118 tons to 5", manganese fitted, perfect condition, immediate delivery. Located Bangor, Maine.
1—Symons 2' and 1—3' cone crushers coarse bowl.
1—McLanahan 21 x 42" all steel single roll crusher.
1—15 x 24 Reliance crusher.
1—Buchanan and 1—Farrel 13 x 30.
3—Traylor 12" x 16" gyratory.
2—Allis Chalmers 6" and 10" Superior.
1—Telsmith 16A crusher.
1—Acme 14 x 26 crusher.

COMPRESSOR

1—Ingersoll Rand 315 cu. ft. of actual air per minute Size 7½ x 6½ two stage, powered with diesel motor Type H oil engine, Model WBFH Size 6½ x 8 with or without Mack truck with pneumatic tires.

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1—Industrial Brownhoist 15 ton capacity 50' boom 100 H.P. Buda motor double drums for clamshell work.

OVERHEAD CRANE

1—10 ton capacity 36' span 220 volt direct current, bucket operating with or without 3 yd. clamshell bucket.

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2—45 ton Heisler geared locomotives 36" gauge.
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1—Allis Chalmers stripping pump 600 GPM 450' head, 1760 RPM 400 lbs. pressure, 125 H.P. 440 volt motor.
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1—P & H Model 900 diesel 40' boom 22' sticks, 200 H.P. Fairbanks Morse 5 cylinder diesel. Used less than 4000 hours with 3 yd. rock or 3½ yd. earth dipper. For sale or rent. Located Cooley, Minnesota.
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CONVEYOR BELTING
ABRASIVE RESISTANT COVERS

Width	Ply	Top Covers
48"	8	1/8" —1/16"
42"	5	1/8" —1/16"
36"	6	1/8" —1/16"
30"	6	1/8" —1/16"
30"	5	1/8" —1/16"
24"	5	1/8" —1/32"
24"	4	1/8" —1/32"
20"	5	1/8" —1/32"
20"	4	1/8" —1/32"
18"	4	1/8" —1/32"
16"	4	1/8" —1/32"
14"	4	1/16"—1/32"
12"	4	1/16"—1/32"

TRANSMISSION BELTING
HEAVY-DUTY—FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18"	6	10"	6	6"	5
16"	6	10"	5	5"	5
14"	6	8"	6	4"	5
12"	6	8"	5	4"	4
12"	5	6"	6	3"	4

ELEVATOR BELTING
HEAVY DUTY RUBBER COVERED

Width	Ply	Top	Covers
12"	6	1/16"	1/16"
14"	6	1/16"	1/16"
16"	6	1/16"	1/16"
18"	6	1/16"	1/16"

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Selected Lot of Chain, Buckets, Belt, Sprockets for Continuous and Spaced-bucket elevators.
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700 Feet 20" wide 8-ply Waterproofed Belt

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50 Head and Tail Pulley Assemblies and Drives
24"x100' Trough Belt Conveyor Equipment
14"x70' Gravity Roll Sections, rolls 6"-center

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10"x7" Farrel Jaw Crushers, type A and B
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8" Traylor Bulldog and 3-K Gates Gyratorys
16"x42 Traylor Crushing Rolls
16"x24" Corrugated 2-roll Crusher
8"x8" Harosh Hammer Mill, No. 1½
No. 5 and No. 6 Williams Jumbo Hammer Mills
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3'x5' 1-deck Multirap, for wet or dry work
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1—No. 19 Kennedy Gyratory Crusher with Ball Bearing Motor, Drive, and Push Button Starter.
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1—No. 40A Telsmith Gyratory Reduction Crusher.
1—No. 32B Telsmith Gyratory Reduction Crusher.
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Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. to 1,000 cu. ft.

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1—Erie Steam Crane, 40' boom with or without ⅝ yd. shovel front.

CRUSHERS
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2—Gyratory Crushers: 1—No. 5 Allis-Chalmers; 1—No. 5 Austin.
1—Crushing Rolls: Size 42"x16" Allis-Chalmers.

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55—Electric ranging from 20 H.P. up to 120 H.P. Consisting of triple, double and single drum with AC or DC motors. Have attached swingers for some.
Gas—hoists ranging from 8 to 120 H.P. single, double and triple drums.

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2—10" Morris Dredge pumps, 1 to direct connect to motor, other belt drive.
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2—Fordson tractors, equipped with winches.
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Fifty 24 gauge brick trucks.
Two Hardening Cylinders.

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12 x 46 & 36" Traylor TY, 10" Newhouse.
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25 & 37 Kennedy, 7½, 9 & 10 McCully.

Jaw Crushers
10 x 30 & 12 x 26" Champion.
10 x 42" Acme, 15 x 36" Universal & Diamond.
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130 HP Caterpillar & 132 HP Waukesha Diesels.
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1⅛ Yd., 1 Yd. & ¾ Yd. HAYWARD Class E.
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25 Ton BROWNING & 50 Ton AMERICAN Locs.
25 Ton LINK BELT K-43 Electric, 70 Ft. Boom.

CATERPILLAR SHOVELS
¾ Yd. Lima Diesel.
2 Yd. Marion Steam Shovel.
¾ Yd., 1⅛ Yd., 2 Yd. & 4 Yd. MARION Electrics.
1 Yd. NORTHWEST Gas.
1½ Yd. LIMA Diesel.
1½ Yd. BUCYRUS 41B Steamer.
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46—KOPPEL 1½ Yd. 24 & 30 In. Ga., V Shaped.
15—2 Yd., 3 Yd., 4 Yd., 6 Yd., 12 Yd., 36 In. Ga.
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Gas: 15, 20, 60, 100 & 120 HP.
Electric: 20, 52, 60, 100 & 150 HP.
Steam: 6¼x8, 7x10, 8¼x10, 10x12, 12x14.

DIESEL UNITS
75, 90, 180, 200 HP F. M. Engines.
110 HP Ingersoll Rand Engine.
175 KVA Worthington 3/60/2300.
275 KVA Fairbanks 3/60/2300.

BALL, ROD AND TUBE MILLS
6x6 Pebble Mill & 5x5 Batch Mill.
5'x22" HARDINGE CON. Dry Ball Mill.
6'x22" HARDINGE CONICAL Pebble Mill.
8'x22" HARDINGE CONICAL Ball or Pebble Mill.
4x8, 8x8 & 10x9 Straight Ball Mills.
4x16, 5x18 & 5x22 Tube Mills & 6'x22'.
2½ x 8 & 5x7 Air Swept Tube Mills.
2x4½, 6x12 & 5x12 ROD MILLS.

PULVERIZERS
JEFFERY 24x30 & No. 1 Sturtevant Ring Roll.
RAYMOND Auto Pulverizer No. 0000, 0 & 2.
RAYMOND Imp. Mills, No. 4, 32 & 55.
GRUENDLER EXB Mill & Jay Bee No. 3 & 4.
RAYMOND 4 & 5 ROLL MILLS & 5 ft. Chaser M.

STEEL STORAGE TANKS
10,000 Gal., 15,000 Gal. & 20,000 Gal. Cap.

MATERIAL BIN
116 Ton Blaw Knox 3 Compt.

800 BARREL CEMENT BIN
400 Barrel Butler Portable Steel Cement Bin with Fuller automatic batcher, push button control.

SEPARATORS AND COLLECTORS
6, 10 and 14 ft. Separators, Gayco & Bradley.

ROLL CRUSHERS
36x66 Fairmount & 36x20 Diamond.

JAW CRUSHERS
10x8, 12x7½, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 26x12,30x15,30x13, 36x15, 36x30, 36x18, 36x14, 36x9, 36x6, 36x10,36x24, 42x9, 44x42, 48x36, 60x42, 84x66, 34x16, 9x36.

CONE & GYRATORY CRUSHERS
42 in. McCully Mammoth Gyratory.
5 No. 19, 25, 27 & 49 Kennedy.
18 in.,24 in.,30 in.,36 in. and 48 in. Symons Disc.
4—10 T2 Traylor 4 ft. Gyratory.
6—Nos. 5, 2 & 6 Austin Gyratory.
2—Traylor T-12 Bulldog Gyratory, also 16 inch.
6 in. Traylor T. Gyratory.
17 Gates K—Nos. 2, 4, 5, 6, 7½, 8 & 9½.
10 Inch Austin Model 100.
6, 10 & 13 inch Superior McCullys.

SYNCHRONOUS MOTOR GENERATORS
100 K.W. RIDGWAY 3/60/2200-250-275 volt.
150 K.W. GEN. ELEC. 3/60/2200-250-275 v.
200 K.W.RIDGWAY 3/60/2200-250-275v.,900 rpm.

SLIP RING MOTORS
52 H. P. GEN. ELEC. 3/60/440 v., 1200 rpm.
(3) 100 H.P.GEN.ELEC. 3/60/440v.,900-1200 rpm.

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BELT: 1000 Ft.60 In.,700 Ft.40 In., 600 Ft.36 In., 800 Ft.30 In., 1642 Ft.24 In., 517 Ft.20 In., 297 Ft.18 In., 800 Ft.16 In., 800 Ft.14 In.
IDLERS: 54 In.,42 In.,36 In.,30 In., 24 In.,20 In.,18 In.,16 In. & 14 In.
Head & Tail—Pulleys—Takeup for all sizes
Steel Frames: 2,000 Ft.24 In..30 In.& 36 In.Sections.

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36 In.x20 Ft.,3 Ft.x20 Ft., 4 Ft.x30 Ft., 54 In. x 30 Ft., 42 In.x24 Ft., 5 Ft.x30 Ft., 5 Ft.x16 Ft.,5 Ft.x60 Ft.,6 Ft.x60 Ft.,6 Ft. x 20 Ft., 6 Ft.x70 Ft.,10x20,7½x100 & 8x110 Ft. Kilns.

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2 Besser Senior No. 8 Strippers complete with 4, 6, 8, 10, 12" widths, 16" and 18" length attachments. 2 25' Besser Mixers, 100 rack cars, crusher, screen, elevators, electric motors for complete plant operation.

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Subject to Prior Sale

Austin-Western Rotary Crusher.
15 x 24 All Steel Blake Type Jaw Crusher.
24 x 18 All Steel 6-7 ton Limestone Pulverizer.
2-3 ton per hour Day Pulverizer.
9 x 16 Reliance All Steel Jaw Crusher.
32" Roller Bearing Disintegrator for 30-40 tons gravel hourly for breaking down and handling clay balls. Also suitable for clay and other products. Practically new.
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Farrell Jaw Crusher, 36" x 18".
No. 1 Jumbo Williams Hammer Mill, 30" x 15".
Continuous Bucket Elevator, belt 16" wide, 105' long.
Continuous Bucket Elevator, belt 18" wide, 100 feet long.
Revolving Screen, 60" diameter x 24' long.
Revolving Screen, 48" diameter x 12' long.
Howe Truck Scale, 1110106, capacity 33,000 lbs.
Fairbanks Self Contained Ten Ton Capacity Truck Scale.
30 ton 4 Compartment Steel Gruendler Jack Leg Bin.
(2) NEW 10 x 16 Roller Bearing Jaw Crushers.

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FOR SALE

One (1) 10' Gayco Separator. Good as new.

$1000.00 f.o.b York, Pa.

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Above prices are given for quick moving.

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York, Pa.

Diesel Cat. Dragline, 2¼ yd., 75' boom.
Gas Shovel & Dragline, 1¼ yd., 45' boom.
Gas Shovel & Crane, ¾ yd.; Diesel shovel ¾ yd.
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Shovel Fronts—¾ to 1½ yd., P&H-NW-Link-Belt.
30 Cat. Bulldoser; Lt. Plants; Car Pullers.
Buckets—Page ⅝ yd. M, 1 yd. HC; 1½ scraper.
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Drag Scraper & Slackline Excavator Equipment.
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Cement Block Machine. Power drive. Besser make. Cheap.

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16, 24-yd. Koppel
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1, 20-yd. Western
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"ANYTHING containing IRON or STEEL"

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Complete layout available. 30" Superior McCully, 4 ft. Symons Cone, and smaller Crushers; Motors, Transformers, Conveyors, Screens, Shovel, Scale, etc. Capacity 220 TPH. Perfect shape. For sale or lease.

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To purchase one used kiln, must be 100 feet long. Also one tube mill to go with same, also motors and drives if available. Must be in good condition. Advise where same can be seen. Address Box A-35 in care of Rock Products, 309 W. Jackson Blvd., Chicago, Illinois.

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1302 ft. Air Compressor.
24 x 36 Jaw Crusher.
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100 to 200 ton Steel Bin.
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30- to 40-ton Locomotive.
100-ft. Stiff Leg Derrick with 3-drum, Electric or Steam Hoist.

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Always buying torn

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Cotton or Burlap

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We pay cash, f.o.b. your plant

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Vibrating Screen
24" Lattice Conveyor—130 feet.
Can be in two or more sections.

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Up to 5000 Acres of Tennessee
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SMALL PLANTS to meet local conditions with flexibility, ample crushing, minimum labor, low first cost and maintenance.
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DESIGN — OPERATION
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PENNSYLVANIA DRILLING CO.
Drilling Contractors
Pittsburgh, Pa.

Positions Vacant

WANTED
OPERATING EXECUTIVE

Qualified to either assist or take full responsibility for operation of group of stone quarries. Must have past record of proven ability and accomplishment and familiar with operating problems, equipment, personnel matters, etc. Permanent position. Give age, past history and last earnings. Address Box A-42, Care of Rock Products, 309 W. Jackson Blvd., Chicago, Illinois.

EXECUTIVE TO TAKE FULL RESPONSIBILITY of Sand and Gravel Plant involving river operations. Must have technical education or equivalent with ability to plan and supervise operations, including production and maintenance. Experience in managing river fleet essential. Applicant state age, full details of past record, experience, earnings and education in first letter. Address Box A-41, Rock Products, 309 West Jackson Blvd., Chicago, Illinois.

Positions Wanted

POSITION WANTED BY GRADUATE Chemical Engineer with 12 years experience in the Cement Industry. Experience has covered Chemical Process Control, Research, Geological Exploration for Raw Materials, Operation and Production of Special Cements, Concrete Service Work. Address Box 996, Care of Rock Products, 309 West Jack-W. Jackson Blvd., Chicago, Illinois.

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SPECIAL jobs often require special tools and while rock handling problems are doubtless common to many, OWEN has perfected and proved the special tool for this job in the Type RA Rock Grapple. Revolutionary, independent tine action, enormous lifting capacity and other exclusive features distinguish it decidedly from other equipment intended for like use.

Write for the new catalog, just off the press.

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BRANCHES: New York, Philadelphia, Chicago, Berkeley, Calif.

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HIGH SCREEN COSTS
USE CLEVELAND "ALLOY" WIRE SCREENS
25 YEARS OF EXPERIENCE DOES COUNT
THE CLEVELAND WIRE CLOTH & MFG. CO.
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The above screening plant turns out 400 tons of graded aggregate per day and is kept supplied with raw material from a gravel bar by a ¾-cu. yd. Sauerman Stackline Cableway.

Increase PROFITS by moving your material the SAUERMAN way

This shows Sauerman Drag Scraper handling open storage of phosphate rock at large drying plant.

Both excavating and stockpiling are simplified by using a SAUERMAN Drag Scraper or Cableway.

These machines dig, haul and dump in one economical straight-line operation. Readily adaptable to varying digging conditions, they will move a given yardage in less time than any other machines of comparable price.

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BELT LACING and FASTENERS for transmission and conveyor belts

ALLIGATOR

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STEEL BELT LACING

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BELT FASTENERS AND RIP PLATES

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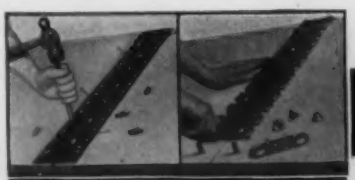
Sold by supply houses everywhere



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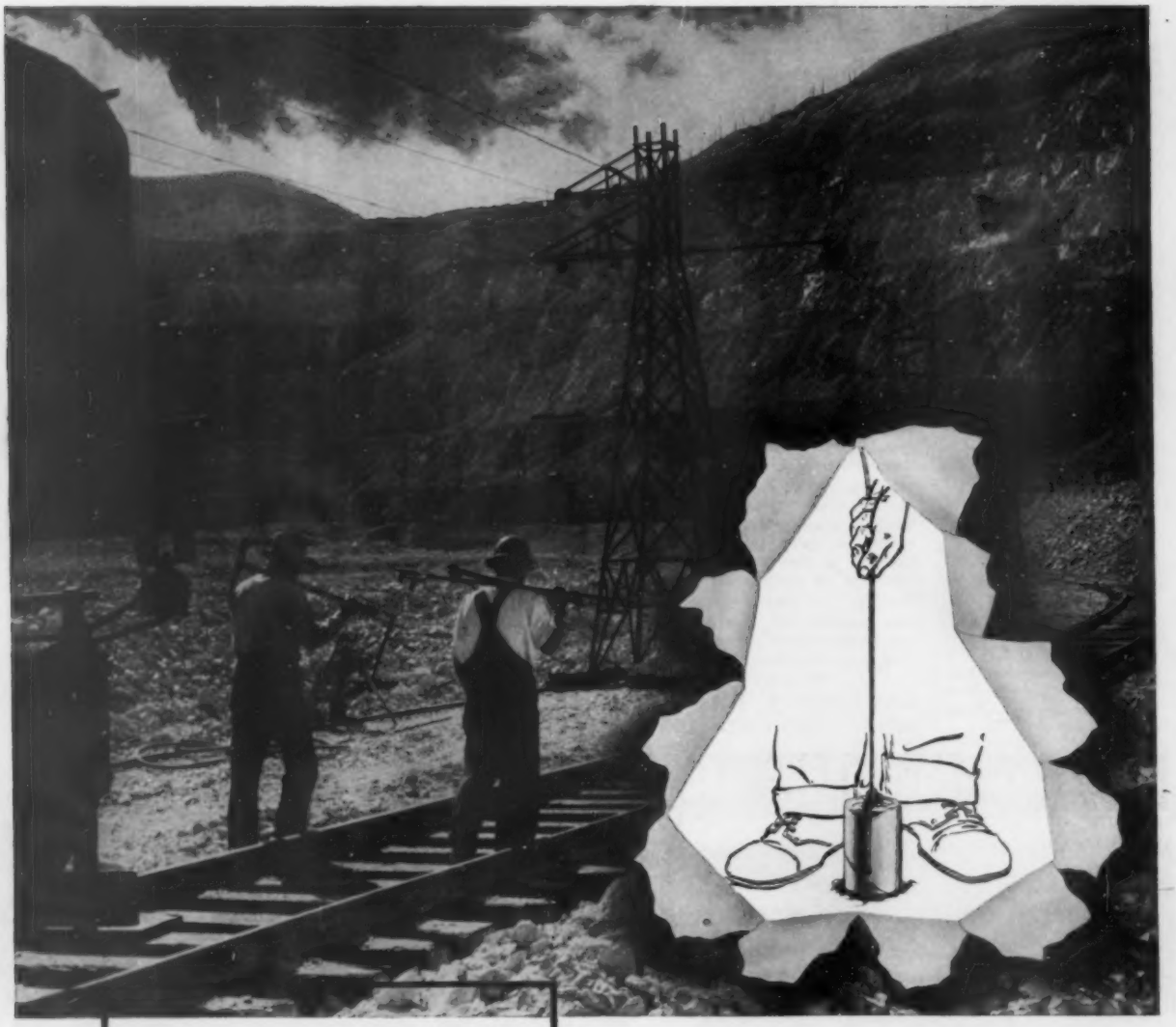
Large capacity, positive action, durable construction, perfect balance, freedom from blinding and rubber cushioned power make SIMPLICITY SCREENS truly the superior screen.

There is a SIMPLICITY GYRATING SCREEN for every problem requiring a separating or grading action. Write for Bulletin No. 41.

SIMPLICITY ENGINEERING CO.
DURAND, MICHIGAN



Primed cartridge– on its way to work

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Primacord may be used on large blasting jobs and small. Try it on your next job.

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SIMSBURY, CONNECTICUT
Manufacturers of Safety Fuse since 1836

PB-44

PRIMACORD-BICKFORD DETONATING FUSE

61% of all Safety Directors Say— "Use Preformed Wire Rope to Reduce Accidents"

EXCERPT FROM PAGE 62, Dec. 1941 "NATIONAL SAFETY NEWS"

Preformed Rope Reduces Injuries

Preformed rope, according to returns from the questionnaire, has been adopted by many companies in order to avoid barbs caused by ends of broken wires. Preformed rope does this in two ways: first, the wire ends do not stick out from the rope when the wire breaks, but continue to lie in position against the rope body; and second, the high resistance of preformed rope to fatigue results in fewer wire breaks developing in a working rope, all other things being equal.

"Buy only preformed rope," cautions the safety engineer of a large automobile company, "since it is safer and cheaper in the long run." The safety officer of a federal government agency says, "There is far more likelihood of workers receiving puncture injuries while handling non-preformed rope than from the preformed type." A metal mine reports that their injury rate and compensation costs due to hand injuries from handling slusher ropes dropped to almost zero when they changed to preformed rope, and two other mines corroborated this report from their own experience. A rubber company says, "We definitely favor preformed rope." Other companies report similar experience.

AMERICAN CABLE

TRU·LAY *Preformed*

When asked, in a survey, how to reduce accidents to workmen handling wire rope, 61% of all Safety Directors said: "*Use Preformed Wire Rope.*" American Cable **TRU-LAY PREFORMED WIRE ROPE** means steadier machine operation and greater production. All American Cable ropes made of Improved Plow Steel are identified by the Emerald Strand.

AMERICAN CABLE DIVISION

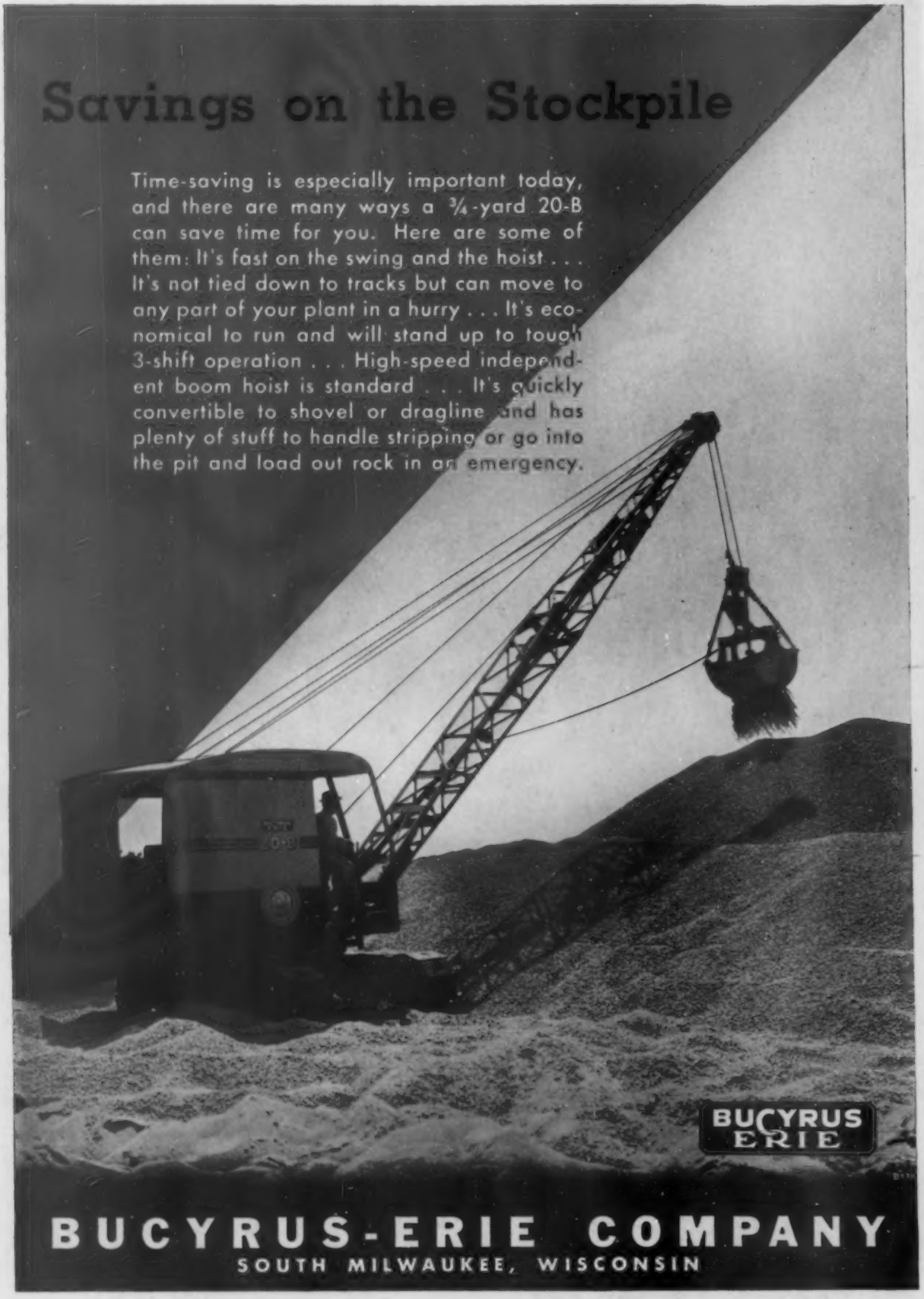
Wilkes-Barre, Pa. • Atlanta • Chicago • Denver
Detroit • Houston • Los Angeles • New York
Philadelphia • Pittsburgh • San Francisco

AMERICAN CHAIN & CABLE COMPANY, Inc.
BRIDGEPORT • CONNECTICUT

ESSENTIAL PRODUCTS . . . AMERICAN CABLE Wire Rope, TRU-STOP Emergency Brakes, TRU-LAY Control Cables, AMERICAN Chain, WEED Tire Chains, ACCO Malleable Iron Castings, CAMPBELL Cutting Machines, FORD Hoists and Trolleys, HAZARD Wire Rope, Yacht Rigging, Aircraft Control Cables, MANLEY Auto Service Equipment, OWEN Springs, PAGE Fence, Shaped Wire, Welding Wire, READING-PRATT & CADY Valves, READING Electric Steel Castings, WRIGHT Hoists, Cranes, Presses . . . *In Business for Your Safety*

Savings on the Stockpile

Time-saving is especially important today, and there are many ways a ¾-yard 20-B can save time for you. Here are some of them: It's fast on the swing and the hoist . . . It's not tied down to tracks but can move to any part of your plant in a hurry . . . It's economical to run and will stand up to tough 3-shift operation . . . High-speed independent boom hoist is standard . . . It's quickly convertible to shovel or dragline and has plenty of stuff to handle stripping or go into the pit and load out rock in an emergency.



BUCYRUS-ERIE COMPANY

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